STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

RENEWABLES PROGRAM COMMITTEE WORKSHOP
DOCKET NO. 96-REN-1890

Tuesday, November 12, 1996
10:10 a.m.

Held at the
South Coast Air Quality Management District
21865 East Copley Drive, Auditorium
Diamond Bar, California

REPORTED BY: **CAROL A. DAVIS**

COMMISSIONERS PRESENT
(Alphabetically Listed)

JANANNE SHARPLESS

STAFF PRESENT
(Alphabetically Listed)

MANUEL ALVAREZ

JONATHAN BLEES

CARRIE HILTON

MARWAN MASRI

SANDY MILLER

VINCE SCHWENT

ROSELLA SHAPIRO

LAURIE TEN HOPE

ALSO PRESENT
(Alphabetically Listed)

DONALD W. AITKEN, Ph.D., Union of Concerned Scientists, Woodside, California

H. I. BUD BEEBE, Sacramento Municipal Utility District

TRACI BONE; Davis, Wright, Tremaine, LLP; San Francisco

RANJI S. GEORGE, South Coast Air Quality Management District, Diamond Bar, California

JEFFREY R. GOLDEN, Amoco/Enron Solar Power Development, Houston Texas

JOHN TOBBIE HOPPER, Valley Air Conditioning & Repair, Inc., Fresno, California

ORVILLE MOE, Energy 2000, Inc., Thousand Oaks, California

ROBERT M. MUCICA, Rockwell Aerospace, Canoga Park, California

LES NELSON, California Solar Energy Industries Association, Mission Viejo, California

WAYNE RAFFESBERGER, Attorney at Law, San Diego, California

DAN WHITNEY, Sacramento Municipal Utility District

INDEX

PROCEEDINGS

COMMISSIONER SHARPLESS: I'd just like to remind the audience that this is an informal Workshop. I would like to ask those of you who are in the back to move up so we can feel a little bit more in touch with you. We've kind of a huge gulf here between us and you.

I want to thank the South Coast District for allowing us to use this beautiful facility. And this will be our meeting to accommodate those of you who live in Southern California and give those of us in Northern California a chance to come down and experience the traffic here in this area.

I am Commissioner Jan Sharpless. And I'd like to open this Workshop with a note of welcome to you who have come here today.

As I stated, the California Energy Commission has established a process to support the Renewables Program Report required by Assembly Bill 1890, which is due to the Legislature in very short order, March of 1997.

The Commission's Renewable Program Committee, which consists of Commissioner Moore and myself, are conducting these proceedings on the report. And, as you can tell, Commissioner Moore is not here today, but is being ably represented by his Advisor, Manuel Alvarez, to my left.

This Workshop is the second in a series of informational Workshops the Committee is conducting on the issues identified in our notices, which were issued on October 4th and October 25th.

In the October 25th notice, we identified eight issue areas for these Workshops. And for those of you who were there last week, you will note that we covered seven of those issues. And today we will focus on the eight issue, which, if you have an Agenda, is cogeneration facilities using energy from environmental pollution in their processes, microcogen and fuel cells.

Now these areas were specifically addressed in Section 37 -- or rather -- 371, 372 and 383 of AB 1890.

Specifically Section 383(c) requires the Commission to include consideration of two issues. And I'd like to read those, because I think the words are open for interpretation and are important. So we'll start off that way.

The first consideration will be for the need for mechanisms to ensure that cogeneration facilities that use energy from environmental pollution in its processes or microcogeneration facilities with a total generating capacity of less than one megawatt remain competitive in the electric services market.

And, two, whether fuel cells should be treated as fuel switching and therefore excluded from the competition transition charge per Section 371.

Now I hope you all have a copy of the Agenda, which I believe was in the back of the room. You will note that we have restated what I just read. And I'd like to take them basically in that order, starting with the mechanisms for ensuring cogen facilities that utilize environmental pollution, and then going forward to microcogeneration and then to fuel cells.

I'd also like to note that at the last hearings that we had last week we did verbally express that we would continue discussion, for those who wished, on items 1 through 7. So that's available today, as well.

Carrie Hilton, who you've seen walking around -- Carrie's waving her hand -- is our Project Secretary. And many of you have already filled out the blue cards, which will indicate to us which items you want to address. I would invite you all to fill out blue cards for those of you who wish to speak. And also invite you to participate.

Also, minor administrative details here. When you come to the microphone to speak, the microphone that's been activated is, I guess, the only one that's sitting, and it's in the middle, if you could please identify yourself and who you are representing. We have a court reporter over here who is taking the transcription of today's hearing.

If your name happens to be difficult or unusual, have an unusual spelling, please spell it for the proceeding recorder.

At the back of the room we also -- perhaps it's the front of the room. Carrie? It's at the front of the room. At the front of the room there is a sign-up sheet. And we would like to have you sign it so we know who is here today.

Also, by way of introduction, I'd like to introduce to my right, Rosella Shapiro, and to my left, Laurie Ten Hope, both of whom are my advisors. As I've said, to my further left is Manuel Alvarez, who's the advisor to Commissioner Moore. And also to my further right is Jonathan Blees, without a sign, but noteworthy, our Committee Counsel.

Now I'd like to turn to our Staff, Marwan Masri, the Project Manager, who I'd like to ask to give Staff introductions.

And also for each topic, Marwan, if you could introduce each topic as the -- as we start on the Agenda.

MR. MASRI: Thank you, Commissioner Sharpless.

And so we are on Item No. 2 now.

COMMISSIONER SHARPLESS: Yes, we are.

MR. MASRI: Vince has been in this proceeding before with me. Sandy Miller is sitting with us today. He is our Staff expert on cogen, and he used to actually do the economic analysis and forecast of cogen for the electricity report for several cycles.

I would just like to say that the cogeneration technology in general has been designated by the Energy Commission for more than one cycle right now as an opportunity technology in the Energy Development Report. And that designation really implies some degree of benefits that these technologies provide to the state, and therefore warrant some form of policy support or otherwise.

The question before us today about microcogen and cogeneration that utilize energy from environmental pollution, whether these two technologies would be competitive in the deregulated market. The question really is not easily answered.

To answer this question, one needs to know basically three things. One is: What is the CTC likely to be, its level. And, second, what the market clearing price is likely to be that this technology would be competing against.

And, third, what are the costs characteristics of these technologies themselves?

In other words, in order for us to determine whether the costs of generation from these systems will be cost-competitive or not, one would need to know these three pieces of information.

So to the extent that the proponents of these technologies can at least provide information about the costs characteristics of the technologies, that would be very helpful in shedding light on this question.

There is a provision in AB 1890 Section 371(b) that talks about changes occurring in the normal course of business. Basically, changes in consumer load as a result of changes in the normal course of business, that the Bill implies would basically be allowed to reduce customer load and therefore avoid part of the CTC, because the CTC would be based on the amount of electricity consumed.

And these two technologies are not mentioned specifically in that paragraph. But there are two provisions. There is -- demand-side management, I believe, is mentioned. Installation of demand-side management equipment. I'm not sure if those technologies can be classified as such or not, but that is important if they do fit that designation or not.

And, also, that paragraph leaves the open category of "other similar factors." You know, how that may be interpreted, I think, would relate to how these technologies eventually are designated by this Committee and eventually the Commission for purpose of recommendations to the CPUC.

And, remember, that we are not the ones who exempt or establish CTC. It's the California Public Utilities Commission. And therefore what would come out of here eventually is a recommendation along those lines, what this Commission would like to see the PUC do on these two technologies.

So with that, I would like to hear from these technology proponents and see what kind of information they can give us.

COMMISSIONER SHARPLESS: Okay. Again I would invite those who haven't, who wish to speak to this issue, to please fill out a blue card. It looks like we have three individuals who might want to speak on this.

And I would like to call at this time Traci Bone forward, who's with Texas Oil [sic] and Energy.

MS. BONE: Good morning, Commissioner Sharpless, Commission

Staff and Workshop participants. My name is Traci Bone, and I am here on behalf of Texas-Ohio Energy Company. Texas-Ohio is a California-based company that markets a product trademarked as the V-O-C Gen, or VOCgen, for short.

The VOCgen was developed by Allied Signal. And it is essentially a cogeneration unit that reduces VOC emissions by burning VOCs as fuel to produce electricity. A company required to reduce its emissions to meet Clean Air Act requirements would install a VOCgen, displacing traditional VOC incineration equipment, such as a thermal oxidizer. The VOCgen also produces steam which can be used in the industrial process.

Marwan, I recognize that you asked for cost information. And I do not have any with me today, but I will be happy to supply that to you as soon as I can get my hands on it.

I will say that as of this time installing a VOCgen is economic. The threat of CTC is what makes installation of the VOCgen uneconomic. And I'll mention that further in my paper.

A typical VOCgen installation produces .5 to 1.5 megawatts. Texas-Ohio has asked me to come here today to talk with you about what the Energy Commission might do to ensure that facilities like the VOCgen remain competitive in California's restructured electric market.

Similar to Mr. Raffesberger, who will talk to you in a few minutes regarding his microcogeneration business, Texas-Ohio is not asking the Energy Commission for money. We are simply seeking to ensure that no new disincentives to development of environmental beneficial and energy-efficient technologies are implemented as the result of California electric industry restructuring.

Specifically, I am referring to CTCs imposed for decreases in an electric customer's load due to deployment of self-generation devices.

Though clearly economic when compared to current electric prices, the economics of the VOCgen evaporate when a VOCgen's customer is required to pay CTC on the electric utility purchases the VOCgen displaces.

At this point, Marwan, you also mentioned that the amount of the

CTC is going to be a significant factor. And that has not been determined yet, but prices as high as 40 percent of current electric prices have been proposed by the utilities.

In its CTC filings at the CPUC, PG&E has indicated an intention to file an application to exempt all self-generation from CTC pursuant to Section 372(c) of AB 1890. However, there is no telling when PG&E will take this step. And the other IOUs have not made a similar proposal.

While the utilities decide what to do, technologies like the VOCgen, which could be providing pollution benefits today. languish. Texas-Ohio believes that there is a simple solution to this dilemma. This is similar to one of the ideas that Marwan raised.

We believe that the energy reductions created as the the result of installing a VOCgen to destroy VOCs are not subject to CTC pursuant to Section 371 of AB 1890. Section 371 provides that certain reductions occurring in the "normal course of business" are not subject to CTC.

For example, reductions created by the installation of DSM equipment or facilities are not subject to CTC. Neither are reductions created by modifications to prediction equipment, nor are reductions due to energy conservation efforts. And, finally, nor are other similar factors subject to CTC.

Texas-Ohio believes the installation of energy- efficient equipment to reduce the emission of VOCs in compliance with the Clean Air Act, as implemented by the Regional Air Quality Control Districts, is the type of "change occurring in the course of business" contemplated by Section 371.

Although we are not adverse to this Commission recommending an outright CTC exemption for VOCgen-type technologies to the CPUC, and to the Legislature in its March report, we believe that AB 1890 already provides a solution through Section 371.

Texas-Ohio respectfully requests that this Commission clarify in its March report to the Legislature that Section 371 includes reductions in electric purchases due to the installation of VOCgen-type technologies.

I would be happy to try answer any questions you might have. And for those in the audience, I have extra copies of our written comments, which were submitted the day of the en banc hearing, if you are interested.

COMMISSIONER SHARPLESS: Thank you very much, Ms. Bone.

I did have questions that dealt with the cost information. So since you will be providing that in the coming days, I will hold those questions.

I am curious about the technology. I still don't quite have a grasp. And I'd like to have a little bit better grasp so we know how -- what this is and how it might be different from other things that we may be dealing with.

You've indicated that basically what it is is you apply a -- it's a substitute for a thermal oxidizer, that is currently used to reduce VOCs from normal generation?

MS. BONE: Actually this is a -- that's an excellent question. The VOCgen is a device that would be installed in a facility such as a bakery, which emits VOCs and currently has a thermal oxidizer which merely incinerates the VOCs. And the advantage of the VOCgen is that it only -- it not only more efficiently incinerates the VOCs, but it uses the fuel value of the VOCs to produce electricity.

COMMISSIONER SHARPLESS: So, in other words, it captures the heat from the heat exhaust of some process, like a bakery process? Is this typically used in smaller -- are we looking at small commercial? Is this also applied in large industrial?

MS. BONE: It could be.

COMMISSIONER SHARPLESS: Who uses this?

MS. BONE: A bakery would use it. And they'd put in like a .5 megawatt VOCgen facility. So I'm not sure where you're drawing the line between large industrial processes and small industrial processes. Up until now, I believe that they've been considering the VOCgen for use in smaller facilities like bakeries.

There's apparently a sample VOCgen-type facility operating right now in Visalia. And it has a .5 megawatt VOCgen facility, which operates in a plastic-extruding plant.

But there have been discussions in other states about using the VOCgen on a larger scale just because, for example, I understand that even in a car manufacturing facility there will be a need to reduce VOCs. And in that situation you need a larger VOCgen, or more of them in order to meet all the VOC incineration needs of that facility.

COMMISSIONER SHARPLESS: So at the moment, however, we're talking about something that produces from that heat anyway from .5 to 1.5, did you say --

MS. BONE: Exactly.

COMMISSIONER SHARPLESS: -- megawatts of --

MS. BONE: Actually --

COMMISSIONER SHARPLESS: -- electricity?

MS. BONE: Yes.

COMMISSIONER SHARPLESS: And if it had larger applications, it could go higher than that?

MS. BONE: It could.

COMMISSIONER SHARPLESS: Is there a difference -- this is just a ruling I have questioned -- is there a difference between this technology and microgen?

MS. BONE: Absolutely.

COMMISSIONER SHARPLESS: How would you define the difference?

MS. BONE: The difference is that the VOCgen sucks up all of the VOCs in a facility and uses their fuel value to produce the electricity. So basically what the VOCgen really is, it's being installed for air emission purposes. The production of electricity is a secondary product.

COMMISSIONER SHARPLESS: Is there a further economic value to VOCgens because of the -- perhaps the air credits? How does that come to play in the economics of this technology?

MS. BONE: I would start off by saying that I'm not real familiar with how the Air Quality Boards work and how air credits are traded. But to the extent that the VOCgen would further reduce VOC emissions from a facility, which would entitle it to air credits -- is that how they work?

COMMISSIONER SHARPLESS: Well, what I'm really getting to --

MS. BONE: Okay.

COMMISSIONER SHARPLESS: -- and I appreciate the fact, even those of us who were in Air Quality, have a struggle sometimes in dealing with Air Quality credits and the process. But the question was really pointed to, one, of whether or not you need a CTC to be competitive, if there are not other economic factors in this technology that would continue to make it competitive? So it's an economic question.

MS. BONE: Okay. As I understand it from the producers or the marketers of the VOCgen, they have taken into account the current economics the air quality control benefits of the VOCgen, in addition to instances in which the VOCgen displaces a thermal oxidizer, which also requires gas to run it and incinerate the VOCs, in addition to offsetting purchases from the electric utility in order to arrive at economics which basically make it equivalent, installing a VOCgen and running it, equivalent to purchasing electricity from the facility.

So many of those economics have already been added into the cost of running the VOCgen.

COMMISSIONER SHARPLESS: So you would say that, despite the needs of some processes to use this to meet air quality standards, that still would not provide enough economic incentive for this technology, and some additional economic requirements would be needed, such as to look at the CTC impact on the price of this technology?

MS. BONE: What I'm saying is that, as it currently stands, without CTC, just compared to what a facility would pay for electric utility purchases, the VOCgen is roughly equivalent in cost.

The addition of CTC -- right now the CPUC has indicated an intent that people will be liable for interim CTC before 1998. The threat of that imposition on top of the imposition of CTC after 1998 makes the VOCgen uneconomic.

It also, because the CTC hasn't even been formulated, it makes it impossible to go forward, because we don't even know what the additional costs are going to be.

Have I addressed your question?

COMMISSIONER SHARPLESS: I would like to see data --

MS. BONE: Okay.

COMMISSIONER SHARPLESS: -- that would verify what you're saying. And I assume that that will be part of the cost information, because I'd like to see what the break points are with this technology.

Recognizing how difficult it is to reduce emissions in the state of California, and this type of technology meeting that need, I'd like to see how all of the factors work to see whether or not this technology would remain competitive despite the CTC.

MS. BONE: Right. And I should reiterate that the reason someone would be using a VOCgen would be to replace the thermal oxidizer.

COMMISSIONER SHARPLESS: Right.

MS. BONE: In effect, to put in a more efficient machine rather than the thermal oxidizer --

COMMISSIONER SHARPLESS: Right.

MS. BONE: -- which uses gas to burn the VOCs and then just releases whatever into the atmosphere.

COMMISSIONER SHARPLESS: Right.

MS. SHAPIRO: Traci, doesn't the VOCgen also burn, use gas or does it --

MS. BONE: Yes, yes. It uses gas in its process. And, for that reason, we do not consider a renewable. We are in a separate category.

MS. SHAPIRO: Thanks.

COMMISSIONER SHARPLESS: Are there other questions?

Yes, Marwan.

MR. MASRI: You may have answered one already. What is the extent of the capacity installed in California today; did you say one and one-half megawatts? Is that the extent of what's on the ground today of VOCgen?

MS. BONE: Oh, there is only one VOCgen. It is currently operating in Visalia, and it is .5 megawatts.

MR. MASRI: And have you or Texas-Ohio estimated the market potential for this? If it was competitive, how many megawatts you think the market potential is?

MS. BONE: I believe that Texas-Ohio has looked at those numbers. And that's something that they would be able to provide to you in the cost data.

MR. MASRI: Okay. Thank you.

MS. BONE: You're quite welcome.

COMMISSIONER SHARPLESS: Traci, one last the question.

Sort of the bottom line is that you would like the Committee and therefore the Commission in its report to recognize that you might qualify for a CTC exemption under Section 371 subsection (e) as a demand-side reduction?

MS. BONE: In effect, that is what would happen. Section 371 is not exemptions to CTC.

COMMISSIONER SHARPLESS: I'm sorry.

MS. BONE: It simply lists those things to which CTC does not apply. So we feel that we would fit under that definition. But the prospect of litigating that with the utilities would certainly make our product uneconomic and tie us up for several years. So we'd like some sort of clarification from the Legislature.

Either that or, if the Commission feels that it's appropriate to be recommending exemptions to the CPUC, and that can be done in a time-effective method, then of course we would be happy with a pure exemption also.

COMMISSIONER SHARPLESS: Um-hum. It indicates the Commission to consider mechanisms. So this would be the mechanism. You have no other options or alternatives that you'd like to present?

MS. BONE: These are the two that seem the most efficient and elegant to us. I'm sure that, if left for a few minutes, we could come up with some others.

COMMISSIONER SHARPLESS: I just wanted to make sure we had full opportunity here.

Are there any other questions?

Yes, Mr. Alvarez.

MR. ALVAREZ: Traci, in your presentation, I'm not sure I understood a reference you made to something regarding the CTC, that it would be 40 percent higher?

MS. BONE: It would be 40 percent of current electric rates. So that if you pay a dollar it would be 40 cents on top of that.

MR. ALVAREZ: Okay. So the analysis I guess you've performed is that the reduction of electricity purchases from the utility that you would use from this technology would actually now be reduced only 60 percent?

MS. BONE: Precisely.

MR. ALVAREZ: All right. Thank you.

COMMISSIONER SHARPLESS: Thank you. Yes. Sandy.

MR. MILLER: Hi. Sanford Miller from the Energy Commission. About what percent of the fuel input is represented by VOCs?

MS. BONE: I am not sure of that. And that is also something that I can provide you with.

And also understanding, Commissioner Sharpless, that you're very interested in air quality issues, I talked with our clients yesterday. And they stated that they would be willing to provide air emission data on the VOCgen, if that would also be useful to you.

COMMISSIONER SHARPLESS: Yes. I think from a benefit side.

MS. BONE: Okay.

COMMISSIONER SHARPLESS: Yes, Mr. Miller.

MR. MILLER: And one other question. Do these facilities qualify under PURPA as a cogen unit?

MS. BONE: I'm not sure that they qualify under PURPA. I do believe that they qualify under the California definition of cogeneration. And, to the extent that those are similar, it would.

MR. MILLER: And one final question. Would it be possible that some of these units may potentially go into a facility where the actual number of megawatts could go up to above one and a half megawatts?

MS. BONE: There are applications that they have talked about outside of California, where indeed that would occur.

I should mention, and this is something that I just learned, each VOCgen is a .5 megawatt facility. And so what they will do is, to meet the needs of someone's VOC emissions, they put in a .5 megawatt VOCgen or two VOCgens or three VOCgens.

MR. MILLER: Okay. Thank you.

COMMISSIONER SHARPLESS: That stimulated yet another question. I guess the level of electricity that is generated has a lot to do with the size of the facility. And so therefore the VOCgen can be sized to meet the VOC fuel stream; is that it? So we can go from one up to whatever they can size it to, they have the technology to do that?

MS. BONE: They have the technology to do that. The primary purpose of the VOCgen is to burn the VOCs. So if a facility produces an inordinate amount of VOCs or -- then you need to have a certain number of VOCgens to be able to handle the burning of all of those VOCs, just like you'd need, I guess, a bigger thermal oxidizer or one that uses more gas to burn VOCs in a facility.

COMMISSIONER SHARPLESS: Mr. Alvarez, did you have a question.

MR. ALVAREZ: Yes. Traci, what percent of the electricity consumption is displaced?

MS. BONE: It depends on the facility. It can be up to about 50 percent of a facility's electricity consumption.

COMMISSIONER SHARPLESS: At .5? I guess if --

MS. BONE: Yes.

COMMISSIONER SHARPLESS: -- we're talking bakeries, huh?

MS. BONE: Yeah, exactly. A one-megawatt bakery would typically use one VOCgen, which would produce half of its electric needs.

MR. ALVAREZ: Of its load.

MS. BONE: Exactly.

MR. ALVAREZ: Is there any sale of electricity back to the utility or --

MS. BONE: Not that I'm aware of --

MR. ALVAREZ: -- to another party?

MS. BONE: -- at this time.

I also understood that the Commission was interested in hearing from people in our situation, whether we have had any problems so far getting interconnection agreements with the utilities.

COMMISSIONER SHARPLESS: Right.

MS. BONE: And because we only have one online at this point, that's a sample, we have not had any problems, so I can't really comment on that issue.

COMMISSIONER SHARPLESS: By a "sample," do you mean it's a demonstration?

MS. BONE: Exactly.

COMMISSIONER SHARPLESS: Okay. Thank you very much.

MS. BONE: You're quite welcome.

COMMISSIONER SHARPLESS: We have Bud -- is it Bee?

MR. BEEBE: It's Bud Beebe.

COMMISSIONER SHARPLESS: Mr. Beebe. From SMUD.

MR. BEEBE: Hello. My name is Bud Beebe. I work for the Sacramento Municipal Utility District.

This is intimidating -- not that, though.

COMMISSIONER SHARPLESS: I know. Sorry about that. Think informal.

[Comments off the record.]

MR. BEEBE: I'd like to speak just briefly on cogeneration.

Certainly cogeneration is a worthy and practical means of increasing the efficiency of the use of many different energy resources. It is not, however, a renewable resource. And we wanted to be on record as assuring that as you go along you make sure that the emphasis for these funds that are to be expended under the AB 1890 Renewables Funds go to renewable energy projects.

COMMISSIONER SHARPLESS: Yes. Mr. Beebe, to that point, I think, if I didn't make it clear in my opening statement, this is in response to specific legislative language where it has asked the Energy Commission to consider mechanisms to -- in these three specific cases to review whether additional mechanisms would be needed to keep these technologies competitive.

The fact that it happens to be sort of stuck in the Renewables Section -- I think it's important to point out that there are people who do not consider these renewables. This is true.

MR. BEEBE: And not to belabor that point, but to note that as you consider what should be done to keep them competitive, be assured that your process does not block these technologies, many of which we at SMUD also promote. But also be assured that monies don't go directly to them, but rather remain in the renewables arena.

Thank you very much.

COMMISSIONER SHARPLESS: Do you have something specific concerning our processes that might block their competitiveness? Do you have something, a specific concern?

I understand the concern about "don't use the money for these particular types of technologies," but is there a concern that's behind your comment that we should not do anything in our process to block their competitiveness?

MR. BEEBE: I don't know of any specific proposals on the part of Staff or others at the CEC that would suggest that nonrenewable technologies would be getting renewable funds.

However, I felt it was important to be on record that cogeneration, however laudable it is in terms of efficiency, simply is not a renewable energy resource.

We have a lot of trouble, we at SMUD, in explaining to the general public the differences between, for instance, cogeneration, hybrid renewable -- recyclable is even often misconstrued as a cogeneration technology in the general public. And we wanted to make sure that on the record cogeneration, however laudable as an energy efficiency means, is not a renewable resource.

COMMISSIONER SHARPLESS: Do you have anything that you could provide the Committee regarding specific mechanisms? I don't think there's any VOCgen going on at SMUD that I don't know about -- well, we haven't gotten there. I'm sorry. I'm ahead of the Agenda.

This is specific to the issue of cogeneration that uses environmental pollution as a fuel source.

MR. BEEBE: That's correct.

COMMISSIONER SHARPLESS: Right. So I thank you --

MR. BEEBE: So we'll be talking on other things.

COMMISSIONER SHARPLESS: -- for sticking to the Agenda. Thank you.

MR. BEEBE: All right.

COMMISSIONER SHARPLESS: Yes. I'm sorry. Sandy, you had a question?

MR. MILLER: Thank you.

What is SMUD's view of cogen as far as being a demand-side technology?

MR. BEEBE: We believe that there is an important issue at play here in allowing cogen -- technologies which happen to also be cogeneration technologies, to allow those, if they're emerging technologies that have important environmental features associated with them, to perhaps give them a little space in which to maneuver so that they can become a more marketable product in the future.

I think that, if this is extrapolated to large cogeneration installations, we will have lost the real meaning of this thought that you really just sort of protect a small market for, say, fuel cells -- sorry -- and other emerging technologies.

Did that answer it, Sandy?

MR. MILLER: Well, not exactly. I guess I was thinking of from the point of view -- I know SMUD has a very ambitious conservation program. And I think you have a few -- there's a couple fuel cell units, but that's another topic.

But as far as cogeneration, just strictly for self-generation purposes, is SMUD's view that this basically is a demand-reducing technology like lighting efficiency or some other technology?

MR. BEEBE: Yes. We fully support the use of cogeneration as a means of more completely using those resources that we have. Sure, it's a good idea, as long as it's done environmentally-friendly. I mean I could suppose you could really louse it up, but in general it's a good idea.

MR. MILLER: Thank you.

COMMISSIONER SHARPLESS: Thank you very much, Mr. Beebe.

Ranji George from SCAQMD.

MR. GEORGE: Ranji George with SCAQMD. I thought I could make some comments on the air pollution issues regarding -- associated with the VOC generation and the air pollution credits that may accrue.

But before that I'd like to thank the CEC on behalf of SCAQMD for conducting its hearing here. And we would like to extend a permanent invitation to conduct its future hearings on this issue or other issues. We'd like to make a strong plea that CEC consider conducting 50 percent of its hearings in the south because --

[Laughter.]

COMMISSIONER SHARPLESS: Not 40.

MR. GEORGE: -- because many of our constituents have not been able to participate in the Workshops, given that most of these Workshops are held in San Francisco or Sacramento. And the more often you come here you'll get a broader participation from people resident here or in San Diego.

Having said that, also I would like to urge the Commissioners to set aside travel budgets for CEC Staff that's -- if needed, from this budget or from other budgets to do --

MR. MILLER: We didn't tell him to say that.

MR. GEORGE: Well, coming back to the VOC generator issue, VOC generator, that's the term, I don't know whether this is the appropriate time to make a comment on air pollution credits or later on.

But, if so, if it's okay --

COMMISSIONER SHARPLESS: Well, this is the item that we're discussing now, so perhaps you ought to provide the information that you think might be helpful to the Committee now.

MR. GEORGE: Okay. Just on a broader framework, we, AQMD has two sets of rules. One is called command and control rules; one is called market-based incentive rules.

Now as far as VOC reductions are concerned, they are all controlled by command and control, that is rule -- so specific rules. And you cannot trade credits in the market based on VOC reductions.

We have another set of rules called reclaim, that where NOx reductions or SOx -- sulfur dioxide reductions can be traded in the market.

Now VOC generator is specific to --

COMMISSIONER SHARPLESS: Excuse me. I thought reclaim was only specifically to NOx and SOx. Have you expanded it to include VOCs?

MR. GEORGE: No. That's what I was coming --

COMMISSIONER SHARPLESS: Oh, okay.

MR. GEORGE: I was just warning that reclaim is only specific to NOx and SOx. So if you reduce VOC from a facility like a bakery, you really cannot trade that in the market.

But if it was NOx reductions they have reduced, like substituting a thermal oxidizer with high NOx with a smaller NOx generator -- when you reduce VOCs using VOC, there is some NOx generated as a result. But I guess it's smaller than the current thermal oxidizer technology.

Now that difference, if there exists a difference, and if that particular facility is large enough, like four tons in a bow of NOx, those reductions may be traded in the market.

Now this may sound a little complicated for those who are not in the air pollution field. But basically there's a clear difference between VOC reductions and NOx reductions. And their aim is, I think, primarily to reduce VOC. And that technology does help in meeting many of other rules called B-A-C-T, BACT, or any kind of so specific. But those credits can only be issued for the particular facility but cannot be traded out.

So I don't think there is much value on air pollution credits as of now.

Now unless a representative can tell us if there are NOx reductions, then we can elaborate a little bit more on that.

COMMISSIONER SHARPLESS: What does the South Coast District do if your command and control rules establish a certain level of VOC for a particular type of facility and a technology comes along that gets under that threshold? Are they able to take that increment that is lower than what's required by the rule and bank them as an air quality credit?

MR. GEORGE: Now there is something called emission reduction credits. And -- but those are -- but I don't believe you can bank them. Yes, I have to figure out -- there are certain specific constraints.

But the scope of the tradability is far less than, let's say, a NOx reduction-type thing. So they may -- she may want to inquire. And, if you want, I can get back on emission reduction credits.

But basically on a command and control, if you set a rule, you just meet it and if it's your lower, there's not much tradability power in that. Okay. So just like mobile source regulations. You have a set of emission standards. If you come down below it, you are not given credit really, per se.

COMMISSIONER SHARPLESS: Would the District consider some kind of rule that it would allow some type of trading if a VOCgen were involved in reducing VOCs to a lower level than what the rule required? Is the District currently considering including some kind of market-based system for VOCs?

MR. GEORGE: Well, the District put in some effort, good effort to do that. And apparently there was a consensus. The issues are far complicated, due to monitoring and reporting and so on, that they have at present discontinued its efforts. And they are sticking to command-and-control-type regulation.

COMMISSIONER SHARPLESS: Okay.

MR. GEORGE: Thank you.

COMMISSIONER SHARPLESS: Thank you.

Okay. I am going to ask Mr. Raffen- -- is it Raffesberger? I'm sorry. Did you want to speak to this issue or was there a different issue that you were speaking to?

MR. RAFFESBERGER: Which issue are you referring to?

COMMISSIONER SHARPLESS: We are currently on Item 2, which is talking about cogeneration facilities that use energy from environmental pollution.

MR. RAFFESBERGER: No. I'm going to speak on microcogeneration.

COMMISSIONER SHARPLESS: Okay. Then why don't we bring you up from microgen, because we're going there next.

MR. RAFFESBERGER: Okay. And I do have a card here I'll give you.

Good morning, Commissioner Sharpless and Staff members and audience. My name is Wayne Raffesberger. I am with Coast Intelligent, Inc., which is a family-owned -- my family -- company, small, 11 employees in San Marcos, California, about two hours south of here.

We are -- I guess I will apologize in advance to all of you for being here. I may be the reason why the microcogeneration language is in the Bill.

In August I spent an adventurous two weeks nonstop in Sacramento and testified about six different times about the issue of microcogeneration to the Conference Committee chaired by Senator Peace.

And, in part, as a result, the language, the legislative directive to you all, to the Commission, was put in to assist us, as Senator Peace put it -- and I'll get into that, in legislative intent and part of my remarks.

I'll also apologize to you in particular, Commissioner, if this is a bit redundant. I did modify some of my remarks. They are correctly dated as of today, but some of what I'll go over is maybe a bit redundant for you from the testimony I gave October 16th at the first Energy Commission meeting. So, please, if I'm boring you, stop me. I don't want David Brinkley accusing me of being a bore.

The first item that I would like to address, and it's been touched on very well by a couple of the speakers already, I don't think there is any question that microcogeneration, and by "micro," again, we are very micro. We are -- 60 kilowatts is the largest unit that we make. We can hook those in series.

The largest one right now in series is -- a hotel in Ventura has three of ours in connection. So we're less than 200 kilowatts for the largest single application that we have, of the many dozens that we have around the country.

Microcogeneration is demand-side management. And I'm -- in reviewing the language of Section 371 again yesterday, it -- we really do fall under that Section, and should have been under there. And maybe had I done a better job of becoming aware of what language was in front of the Conference Committee in August and been up there earlier in the year.

Maybe if we had an association of microcogenerator manufacturers or representatives. And if there is one, we're not a member. I'm not aware of one. And they certainly were not there in August, unlike the large cogenerators that were at the table, like the California Cogeneration Council.

And I spoke with their executive director this week. Their smallest-sized member has 30 megawatts as a project. So we're radically different. We're a fraction of the size of any of that.

And I can understand why some of the utilities, in looking to collect CTCs, were concerned about large cogeneration. Those are mini power plants, if you will. And they are, in fact, competition. We're not. We're not a mini power plant.

We are simply a demand-side management tool, that the applicant or the small businessman or -woman, or the public facility, the hospital or the school district uses to reduce in part -- but only in part -- their electrical load, and uses those savings to pay for our unit, to maintain, to pay us or someone else to maintain the unit and to pay for their -- comparable to utilize the thermal energy.

Section 371 in several different sections, as Ms. Bone earlier mentioned, we might with maybe a strained legal interpretation already be in there. I don't know.

But I'd rather not try to have to make that argument. I'd rather the Energy Commission agree with us and then recommend to the Legislature that, as they did understand in August when they directed us to come to you and you to address this industry, mistakes may have been made in that Bill. It was a very comprehensive Bill.

And some small segments of the industry like microcogeneration were overlooked, as Senator Peace specifically said when I was testifying. And in apologizing for that he said, "Look, you know, you just weren't here earlier. And we're going to try to help you. And we're going to send you to the Energy Commission so they can suggest some ways to fix that."

Simply defining microcogeneration as a demand-side management product would solve the problem for us. But beyond that, it would be obviously cleaner or another technique or mechanism, if you simply recommended an exemption in general based on the longstanding public policy that -- I know you're aware of in this state and in federal law -- for cogeneration as a benefit to society in general.

Another way that you could address that issue is to redefine microcogeneration. I'm not sure where the definition popped out during those couple of weeks in Sacramento, but all of a sudden I noticed the definition in there of one megawatt or less.

I didn't ask for that. It was asked of me while I was testifying. Again, we could have lived very well with the definition of exempting microcogeneration if it's something like 250 kilowatts, just picking a number out of the air.

So that would be a way, because if the issue is competition or new power plants, there aren't going to be many of that size. There aren't going to be enough to be significant. There aren't going to be enough to impact, really, in a significant way the collection of CTCs to any utility during the period of CTCs.

Another way would be to have you recommend an extension of the pipeline for exemption. We are going to be in a great deal of confusion, as Ms. Bone referred to her with her VOCgen project. It's the same issue for us. If we do whatever projects we've done this year in California, or we do next year, until it's clear to us what the CTC amount is and how it's collected and when, we don't know the real economics of a project.

And the economics, as tough as they are right now, when you add in the CTC uncertainty or if it becomes a certainty, the project becomes uneconomic.

To go backwards retroactively and say that a microcogeneration project had to be contractually committed to in December of 1995 or already online, as the Bill refers to, doesn't make any real sense.

It would make sense with large-scale cogeneration, because those projects are in a multiple-year planning line. They really are like power plants. They have tremendous permitting and regulatory hurdles to overcome. And we don't, really.

Our projects can be done in a matter of months, if the customer is willing and we work cooperatively with the local utility and the regulatory authorities, like South Coast Air Quality Management District, whom we do work with now if a project is in this area.

But, again, the uncertainty right now for us is whether or not a project that we're doing today or next month or six months from now the math involved is correct or whether it's going to be upside down, should the CTC numbers come out and be much higher or a level that just simply can't make the project pencil out.

Again, if all of that is not something that the Energy Commission is comfortable with, or any of the above, then exempt or recommend an exemption for public benefit projects. Most of our projects are in public benefit type of facilities. They're in schools. They're in hospitals. They're in nursing homes. They're in municipal swimming pools.

Again, I recommended that to the Legislature. And it was so late in the game that I think they said, "Look, just go to the Energy Commission and make those same arguments."

But I think a very compelling argument can be made that it's in all of our interests if those kinds of facilities stay open to serve the public, because they have been able to do demand-side management through products like ours, to be energy efficient, reduce their costs and therefore afford to be open.

And, finally, the financing mechanism language that's -- I believe it's Section 372, but I could be wrong about that -- where the Bill recommends that, if all else fails, we might go hand-in-hand with the utility to the CPUC and ask for some sort of financing mechanism from the pool of CTC bonds that's supposed to be created.

It was a nice idea. Senator Peace directly asked me about it, caught me unaware and said, "Don't be alarmed, because I just thought of the idea. I want you to think about it for a day or so."

And when I got back to him and testified the next day, I said, "Frankly, Senator, I don't understand how that could work since at least a couple of the utilities that we're aware of are openly hostile to cogeneration of any size. It's inconceivable to us that they would go with us cooperatively and apply on our behalf to the CPUC for any kind of relief."

I still don't understand how that could work. He felt it could in some way. It is unclear in the Bill, as I think you would agree.

So the recommendation there would simply be to, as it difficult as it would be for me alone, because that's who the responsibility would fall to, to stand in front of the CPUC and argue for a financing mechanism relief on CTCs. At least I could try it. I can't the way the Bill reads today.

Finally, as I said in October, I think the Legislature just clearly made a mistake in looking at microcogeneration. Our product, if you are staying with the local utility, you're simply reducing your load. That's not the kind of stranded cost recovery that FERC was talking about when it put out its Order 888 in April of 1996, the order that urged or directed the states to begin to deregulate and look at deregulating.

They went in great detail in many references within that hundreds of pages of Order and as to discussion about the issue of stranded cost, but nowhere could I find a reference to a situation like ours where you're simply reducing your load.

They always refer to language that talks about departing the utility or moving to another supplier. And we're not doing that, again. We're demand-side management product, not a tool to assist someone to start shopping in the open market for a new utility supplier.

And, finally, again, with legislative intent, as I think I've already touched on, I don't think we could argue about what the literal language of the Bill reads today. But legislative intent is where the argument would really be made.

And since I was there, the legislative intent was clearly not, whether you should consider helping us, but help us -- or help this industry and suggest to the Legislature ways that that could be done.

With that I will try to address a couple of things that have been brought up by Staff. One was -- on the phone with me -- one was the interconnection agreement and do we have difficulty with utilities. Not per se.

My understanding is that each utility has different districts. And the interconnection agreements can be within their subdistricts. A problem in some areas for us and not a problem in others. It really depends, frankly, on the utility's personnel and whether they want to be cooperative.

A more comprehensive rule would certainly help the industry and anyone else working with them on this. But right now they pretty much go about any way they feel like. But even that, I'm not trying to imply there's a major problem. There isn't. It's just time-consuming.

It is a little more expensive for the customer, because at some points they require us to put in extra meters, meters that are, in fact, superfluous and don't do anything for them or for the user.

The other issue, Marwan, I'm not sure that I can address your question of cost. And I'm not sure that I understood. Maybe you could help me with what kind of cost information you were looking for in relation to microcogeneration.

COMMISSIONER SHARPLESS: Marwan, would you like to ask that question so that the audience knows what was being asked?

MR. MASRI: Yeah. For example --

COMMISSIONER SHARPLESS: To match the responses. This is like "Jeopardy." So what's the question?

MR. MASRI: The question is if you know how much does your system produce power at cents per kilowatt hour. Possibly the components of that. How much of that is capped, how much is O&M, how much is fuel and so on.

MR. RAFFESBERGER: Okay. I have a short answer for you. I don't have the breakout on it. But I did have that answer at my fingertips in August thinking it might get asked, and that's the reason I know it.

If you figure in everything, O&M, the capital cost and the gas, we can produce electricity for slightly over 5 cents a kilowatt. Does that answer your question?

MR. MASRI: Yes. Thank you.

MR. RAFFESBERGER: Are there any other questions?

COMMISSIONER SHARPLESS: Yes. I guess sort of along the same lines, stepping back a bit.

You indicated in the beginning of your comments that you're not a part of an association and you're a small company, family-owned company. But I have not yet gotten a sense of how big the microgen market in California might be. Is there any way that the Committee would be able to determine this?

MR. RAFFESBERGER: Yes, Commissioner. Your Staff, as a matter of fact, suggested that that question would come up. And I tried to ask some other folks. I asked the executive director, as I said, of the California Cogeneration Council, thinking that maybe she had some information or some smaller members, smaller-sized cogeneration members. She does not have, either.

I went through a couple of the pages. There's some Web sites on cogeneration out there in the Internet. And some people are trying to sort of build a database. And there are a lot of companies listed in there. How many of those are actually like us, a manufacturer of what would be called a microcogenerator, I don't know. I would say that there's at least a dozen.

Now there are at least a couple of other large manufacturers outside of California who do sell in California. Magnitech --

COMMISSIONER SHARPLESS: And these would all fit the description of one megawatt or less?

MR. RAFFESBERGER: Yes, yes. If you're talking our size micro, not all. For example, Caterpillar, a well-known name, has a branch in San Diego, where I'm from. Solar Industries is owned by Caterpillar. They make a cogenerator which is used a natural gas fields and petroleum fields around the world.

And I think their smallest unit is 250 kilowatts, but I could be wrong about that. But they're not down to our size. So there are others that are under -- that are technically a cogenerator. Not -- again, not all of them are even trying to compete in the particular market that we are, sort of public facilities.

COMMISSIONER SHARPLESS: Can you help me out in terms of the definition of "demand-side management"? When does a cogeneration facility stop being demand-side management and become a substitute?

MR. RAFFESBERGER: Well, I think it would only be a --

COMMISSIONER SHARPLESS: For a supplier?

MR. RAFFESBERGER: It would only be a substitute, like the other product that was mentioned when the question was asked. To the best of our knowledge, our customers, the most any one customer reduces their load is up to about 50 percent. Typically it's even less than that. So it's never a substitute.

So I think the answer is it's always a demand-side management, or the math doesn't pencil out. If you're not reducing your load somewhat, you're not able to make the thing pay in the first place.

But if you're having -- if you're running the unit so much that you're trying to sell back to the utility grid, for example, under PURPA, which was asked earlier, none of our units do that either.

I'm told from --

COMMISSIONER SHARPLESS: And that's because it's not economic; is that what you're saying?

MR. RAFFESBERGER: Right, correct.

COMMISSIONER SHARPLESS: I'm trying to understand why it wouldn't be economic.

MR. RAFFESBERGER: That -- you're starting to exhaust my -- if you have an interest in that area, Commissioner, I'll try to get more information back from the company and give it to you in writing, why that would be true, because it's not my bailiwick, really, within the company.

And I don't do the cost estimating and then run the numbers and the costs, the projected cost savings, those kinds of things, when we bid jobs. Never really have and not familiar with it at my fingertips, but I could provide it if you're interested.

COMMISSIONER SHARPLESS: If it were not for the CTC, would you say that your technology would be competitive?

MR. RAFFESBERGER: Yes. But it's only competitive -- and that's why we're not really -- why I was somewhat astonished by the opposition of some of the utilities.

The plain fact of the matter is if it was easy -- set aside the world of

CTCs all together and let's just say we had a level playing field.

If it were easy to do a project like ours, first of all, we would have a lot of competitors. And a lot of the manufacturers of cogenerators in California, the small ones, small companies, have gone by the wayside.

I could name you three companies off the top of my head that I know of, in the last five years, that are no longer in the business. And they used to be out there, larger than us, much more aggressive than us all over the state selling the same size unit that we sell. So it's a difficult market, in the first place.

And the product has to work per a qualified facility in terms of getting the preferential natural gas rate. If you can't factor in those kinds of savings, as well as the reduced electrical load, the economics are not going to pencil out in the long run. You're not going to be able to convince the customer that given a several -- you know, two-and-a-half to four-year, on average, payback, they're not going to front-end load the capital cost. They're not going to spend the money upfront for the downstream savings.

Not -- you know, big companies can do that. Look at a 10- or 15-year line, and say, "If we get it back in year 9 or 10, okay, fine. We'll get it back eventually," but not the facilities that we talk to. They've got to see it sooner.

So, yes, we are competitive, but only in the specific application, which is why the market isn't that great. It's why it's such a tough industry, totally apart from the issue of CTCs.

Again, otherwise, we'd be a lot bigger, a lot more profitable. And we'd have a heck of a lot more competitors still out there still doing it.

COMMISSIONER SHARPLESS: So there doesn't sound like there's much growth in your industry?

MR. RAFFESBERGER: There's some. There's some. We're growing, but very slowly.

COMMISSIONER SHARPLESS: So those customers that have already installed your equipment -- we're really talking about your new market, not your old market, right?

MR. RAFFESBERGER: Mm-hmm, mm-hmm.

COMMISSIONER SHARPLESS: Are there any other questions?

MR. RAFFESBERGER: Now, Commissioner, I don't know if I've addressed -- pardon me for interpreting. But you may be driving at an area of "What happens in the truly deregulated world in a few years." Do I think there's a market for cogeneration? Yes, I absolutely do.

I think there is one because there's going to be -- and I think that's one of the reasons why the Legislature was cognizant of suggesting or asking you to suggest to them ways to make sure that the industry, as they word it, remains competitive.

COMMISSIONER SHARPLESS: Yes.

MR. RAFFESBERGER: We want to keep that -- as many tools as we possibly can out there for business and public institutions in this state to allow them to, in effect, really shop for their energy needs.

And that is competition. That's what the deregulation Bill is supposed to be about.

COMMISSIONER SHARPLESS: Are there other questions?

Mr. Alvarez.

MR. ALVAREZ: Did I understand you correctly, there is no sale back to the utility for any of the projects you're involved with?

MR. RAFFESBERGER: Not that I'm aware of.

And we don't predicate any of our numbers on that basis, no.

MR. ALVAREZ: So when you do your economic analysis, you don't look at the project. But do any of the microcogens actually have a sale agreement back to the utility at all, or is it just nonexistent?

MR. RAFFESBERGER: Well, all of them have to have an interconnect agreement, as I'm sure you know.

MR. ALVAREZ: Right. That's my next set of questions.

MR. RAFFESBERGER: Yeah, all of them have an interconnect agreement. We're required to.

But as far as a repurchase agreement, specifically, I honestly don't know the answer to that.

MR. ALVAREZ: Okay. And what --

MR. RAFFESBERGER: I don't think so.

MR. ALVAREZ: -- do you see as the foundation of the whole purpose of the interconnection agreement with the project and the utility?

MR. RAFFESBERGER: The purpose is we're required to do it.

MR. ALVAREZ: So from your business perspective you don't see a real need for that agreement?

MR. RAFFESBERGER: No, no.

MR. ALVAREZ: And you could operate, if you didn't have to --

MR. RAFFESBERGER: That's correct.

MR. ALVAREZ: -- sign that agreement?

MR. RAFFESBERGER: That's correct.

MR. ALVAREZ: So who forces you to sign that agreement? Does the -- your customer send you to the --

MR. RAFFESBERGER: It also -- it also -- in some ways, I'm probably misspeaking myself, Mr. Alvarez, a little bit, because in some ways with most of our units, virtually all of them are induction cogenerators. And they have to be able to talk to the utility grid for monitoring purposes and that kind of stuff.

MR. ALVAREZ: So does a synchronization --

MR. RAFFESBERGER: That's really -- that's really the other reason why you need an interconnect agreement, even for our purposes. It's not for the purpose of running power back through their grid, but it's more for the connection.

MR. ALVAREZ: Okay. And you mentioned this question of payback by your customer. Payback period for the investment in the microgen.

MR. RAFFESBERGER: Yeah, um-hum.

MR. ALVAREZ: What kind of parameter do they look at? Are we looking at a three-year period of time --

MR. RAFFESBERGER: We estimate two and a half to four. It depends on the use.

MR. ALVAREZ: Um-hum.

MR. RAFFESBERGER: The size of the unit, that kind of -- and what they're -- and as you know, the energy bills differ around the state. It depends on what their paying the utility today and what they're paying for gas. So it'll always vary. But that's a typical.

MR. ALVAREZ: Okay. Let me ask one question. In your testimony you talk about exempting only public benefit projects.

MR. RAFFESBERGER: Yeah. I mean -- so that would be the least preferable to us, of course. I mean it eliminates us for a several-year period, we think, being able to compete with and help small businessmen or -women put our product in.

But we think there's enough of a market in the public facilities arena that we could at least survive during that era. And then when CTCs go away, per the Bill, we can go back to looking at the other things.

It was just a thought I had back in August, to be honest that, again, on a public policy argument, I thought maybe that one made some sense.

MR. ALVAREZ: But you would see that basically as a requirement of this Agency to recommend to the CPUC, that public agencies be exempt from the CTC --

MR. RAFFESBERGER: Correct.

MR. ALVAREZ: -- if they move towards a cogeneration or a microgen strategy?

MR. RAFFESBERGER: Correct.

MR. ALVAREZ: Thank you.

COMMISSIONER SHARPLESS: Yes. Ms. Ten Hope.

MS. TEN HOPE: Do your customers need to have a time-of-use rate to be competitive?

MR. RAFFESBERGER: I'll be honest, I'm not aware of that term so I don't know. Again, I don't --

MS. TEN HOPE: It sounded like you were saying that -- it seemed like there needed to be a high rate during certain times of the day, you're trying to reduce their demand --

MR. RAFFESBERGER: Oh, I'm sorry.

MS. TEN HOPE: -- down?

MR. RAFFESBERGER: Yeah.

MS. TEN HOPE: Otherwise they're not cost competitive if they're average rate is lower than 5 cents a kilowatt hour?

MR. RAFFESBERGER: Right, they wouldn't be.

MS. TEN HOPE: Okay.

COMMISSIONER SHARPLESS: Any other questions, Staff?

Yes, Mr. Miller.

MR. MILLER: Thank you. I think -- to clear up a couple of questions that Manuel had, I think under the interconnection agreement with the utilities --

COMMISSIONER SHARPLESS: Can you speak up, Mr. Miller?

MR. MILLER: I'm sorry.

COMMISSIONER SHARPLESS: Maybe directly in the mic or something.

MR. MILLER: I think the utilities -- the cogen has a couple options. One is a surplus sale agreement where they would use all they generate. And then any surplus they would sell back to the utility.

And then there's another one, which would be the net arrangement, where they sell everything to the utility and purchase their power back from the utility. So they -- and I think Mr. Raffesberger is correct. Once they get into the interconnection agreement, and they basically have that option of selling the power back to the utility.

But I think another issue on the cogeneration is a lot of these very small ones, or it doesn't make any difference what size they are, a good cogen unit basically has to use all of the -- pretty much all of the thermal output in order to be economic.

MR. RAFFESBERGER: That's correct.

MR. MILLER: And I think that that's a problem with a lot of small cogen, is that some of the facilities can't use the power at night, and so they have to dump the heat. So that certainly gets into the economic aspect of it.

Thank you.

COMMISSIONER SHARPLESS: Thank you.

Any other questions?

Thank you very much.

MR. RAFFESBERGER: Thank you.

COMMISSIONER SHARPLESS: Oh, Marwan, I'm sorry.

MR. MASRI: Yeah. Just a quick one.

Mr. Raffesberger, do you have any suggestions besides the CTC, to follow up on Commissioner Sharpless' question earlier to Ms. Bone, things that could help a technology like this become competitive?

MR. RAFFESBERGER: Other than the ones that I listed out in terms of the specifics of the Bill, all of which do relate to the mitigation of CTCs or exemption from CTCs, in general, do I have a suggestion as to how the industry could be encouraged? Probably to make sure that PUC Section 454.4 stays in the law. And that's the one that I think that is basically -- allows us to get -- if you're a qualified facility, to get a preferential gas rate. That is not under threat that I'm aware of, but I suppose it could be.

MR. MASRI: That was actually my next question. Do your systems meet the minimum PURPA requirement of efficiency of a full two-and-a-half percent --

MR. RAFFESBERGER: They're twice that. Our efficiency studies are in the 80-percent range.

MR. MASRI: So these systems do get the preferential gas rate right now?

MR. RAFFESBERGER: Um-hum, correct. Yeah.

MR. MASRI: In recommending that the Commission recommend that microgen be classified as DSM, would you qualify that to be limited to only cogen that does not sell to the grid, but only displaces its onsite load?

MR. RAFFESBERGER: I could live with that, yeah.

MR. MASRI: And your systems are up to 60 kilowatt. Does that mean you don't sell to any customers who have loads less than that? If somebody was with a 20-kilowatt load and buys --

MR. RAFFESBERGER: We -- we actually manufacture -- we started out making even more micro than we do now. We actually started out making 20-kilowatt machines, and found that the market niche was so small that it was not economic for us, so we quit.

We can make one if someone wanted to. But you're getting down at that point into something like a laundromat or maybe a big laundromat. So --

MR. MASRI: So what I meant is do you sell your system to customers who have loads less than the size that you're selling them, so that, in fact, they have the option of selling to the grid if they wanted to, or are your units always sized to be less than the customer's load, that you're selling to?

MR. RAFFESBERGER: The answer is the latter.

MR. MASRI: Okay.

MR. RAFFESBERGER: But I don't know that there's anything that would necessarily prevent them from, if they were going to try to sell back to the grid. I don't know that they would -- the economics would work out for them, but -- we do make a 20- and a 35-kilowatt. And, as I said, the 60 is the largest we make at the moment. But they can be hooked in series, up to three or four of them in a row.

Commissioner, one last thing I neglected to --

MS. SHAPIRO: Wait. I wanted -- before you move on.

MR. RAFFESBERGER: I'm sorry. Oh, yeah.

MS. SHAPIRO: But don't you sell your units sized to meet thermal load and not electrical?

MR. RAFFESBERGER: Yes, yes.

MS. SHAPIRO: Yeah.

MR. RAFFESBERGER: Yes. Really that's true, yeah.

And, as the gentleman said a minute ago, if they're not using a hundred percent of the thermal, the math isn't going to work out. It makes no difference what Sacramento's doing or CTCs are doing, it's the plain economics of that particular application. If they're not working, we're not going to make a sale. That's why we make so, you know, not that many sales in a typical year.

COMMISSIONER SHARPLESS: I guess one of the questions there is that this applies to the way that your business operates, but I'm not sure that it applies to anybody who would fall within the definition of microgen?

MR. RAFFESBERGER: That's true. I --

COMMISSIONER SHARPLESS: I don't know what other --

MR. RAFFESBERGER: Yeah. I can't -- I can't -- I don't pretend to speak. I'm not an industry association. I can't pretend, Commissioner, to speak for other microcogenerator people, manufacturers or sales representatives. There weren't any of them there, those last two weeks in Sacramento.

But it doesn't mean that they may not have different applications than I've talked about or that they may not be, in fact, predicating a use on sale back to the grid. I'm not real sure about that.

COMMISSIONER SHARPLESS: Okay. Thank you.

MR. RAFFESBERGER: The one last point I wanted to point out for you --

COMMISSIONER SHARPLESS: Right.

MR. RAFFESBERGER: -- is with your interest, I know, in air quality.

We have actually manufactured for us by Johnson Matthey, one of the largest catalytic converter manufacturers in the country, a custom catalytic converter on our units. It has been tested to the satisfaction of South Coast Air Quality Management District.

In terms of NOx, the standard at one point was .3 grams BHP hour, I think. I think they're now down to .15. We by -- and we have tests by a company that's certified by the CARB. I don't have an extra copy of that test, but if you wanted it, I'd be happy to give it to you. We can get NOx down to .01.

COMMISSIONER SHARPLESS: Cleaning up the air almost, huh?

MR. RAFFESBERGER: Getting close, yeah.

COMMISSIONER SHARPLESS: Okay.

MR. RAFFESBERGER: So we believe that we are, as the language of the Bill talks about, it talked about the policy of the state to encourage not just cogeneration, but I think there's language in there somewhere that talks about environmentally- friendly and energy efficient. We're all of those things. I don't think there's any question about that.

COMMISSIONER SHARPLESS: Before you leave the podium, I did just want to loop back.

I think you mentioned this in your testimony. It does have to do with Section 372(e).

MR. RAFFESBERGER: Let me --

COMMISSIONER SHARPLESS: And I think this is the section that you feel you're precluded from going through -- if one of the options were to allow you to go to the CPUC --

MR. RAFFESBERGER: Yeah. That is the one I was referring to.

COMMISSIONER SHARPLESS: Yes. The way this is written, it implies that -- well, it doesn't imply -- it states that electrical corporations may apply to the Commission.

MR. RAFFESBERGER: Correct, correct.

COMMISSIONER SHARPLESS: And you see this as precluding you, because you are not an electrical corporation, from going to the CPUC --

MR. RAFFESBERGER: By definition --

COMMISSIONER SHARPLESS: -- and making that case?

MR. RAFFESBERGER: By definition in the Bill, we are not an elec- -- well, actually the Bill refers to a definition on an electrical corporation, I think, of Section 218 of the Public Utilities Code, if I'm not mistaken. But, in any event, the definition of an electrical corporation we do not meet.

COMMISSIONER SHARPLESS: Um-hum.

MR. RAFFESBERGER: I pointed that out to -- in fact, some of the other people testifying, John White from CEERT also pointed that out, that it was a bit absurd to ask the lion, so to speak, to lay down with the lamb and go hand-in-hand to the CPUC.

Again, we don't think we're competition for utilities. But, for some reason, they seem to think that's the case. Some of them do, anyway, not all of them. And I pointed that out, that that language should have said "an electrical corporation or interested party." Just add that in, that would have been fine.

But they didn't want to do that at that point. They said, "No. Look, we'll let the Energy Commission worry about that," or whatever. But they didn't make that change.

COMMISSIONER SHARPLESS: Okay. Thank you very much.

MR. RAFFESBERGER: You're welcome.

COMMISSIONER SHARPLESS: I believe we also have a Mr. Hopper who's here to talk about microgen.

Mr. Hopper, would you like --

MR. HOPPER: Yes. Commissioner Sharpley?

COMMISSIONER SHARPLESS: Sharpless.

MR. HOPPER: Sharpless.

COMMISSIONER SHARPLESS: That's okay.

MR. HOPPER: And the Committee and the audience. I was not planning on speaking at all. As a matter of fact, the person I was going to send to speak had other things to do, so I filled in for him.

But after listening I decided to speak at the last moment. In reference to the KW production that the gentleman just stated is pretty much what Valley Air Conditioning -- we're out of Fresno. We have over 30 sites that we have installed and maintained throughout the Central California.

The production of the KW with the cogen is in at about 5.5 cents per KW. To sell it back to the utility, being in this case PG&E, you're looking at four and a half. So it's a loss issue. We wouldn't even consider that concept. But on the -- and there again, you're going to have to -- I'm not a real good speaker.

But on the demand-side management, right here I was going through, as I decided to speak, I'm going to reference a school, Delano High School. It's in the Valley, as you know, just the other side of Bakersfield.

They're enduring utility bills of in and about $39,000 a month during the month of August. And it will hold in or around 25,000 year round.

The reason I brought this issue up is that the demand charges, given the 25,000, the demand charges is in at about 15,000 of the 25,000. This could be offset with a cogen running six hours a day. And this is what our company has started looking at more recently.

As you may know or may not know, the demand charges -- let's go back three years -- was in about $7.80 a KW. Today I'm seeing $17.00 plus. I think in this particular case I'm referencing to is the $17.95 per KW. It doesn't sound like much, until you multiply it out by 600 KW.

And so we're looking at that part as using a cogen. But if we have to buy into these plants, such as a school, in other words, we have to pay the utility to put a system in, the economics are not there.

At this point in time we ask for no help from the state or government in any way, shape or form. We simply want to be left alone, and let us move forward and do what we do best. And we've done this.

And I can give you numerous of schools and colleges and hospitals that we've done. The proof is in the pudding, is what I always say.

Mr. Sandy Miller is quite aware of some of the things that I'm saying because my office -- actually I've never met the gentleman -- by the way, hello -- but he works with my office quite -- through the phone and that type of thing. And I'm not involved that much into it.

If this goes to where we're going to have to do what I call a buy-out and what you're calling is the CTC, this is going to just flat cease to exist. At this time we're doing a private college in Fresno, California. It is -- the name style is Fresno Pacific College, one of the better private colleges in the state of California.

They needed to update their HVAC. I give them a price. This is a 192,000-square-feet complex. The price to update their HVAC exceeded 750,000. There was a small issue: Cash flow. Lack of money.

So we devised a way, with the help of my staff, to implement cogeneration into that plant with water-to-fire absorption shelter, which is also a very economical way to cool a complex of this size, and putting it all together. And I happen to just have a set of plans of that project. Nevertheless, we secured the money from private enterprise. And it's a 6.6-year payback with no cash outlay.

These type of stories you're going to just kill if there is not need to where the utilities or the PUC or whoever -- government, I'd always like to say -- I like to put everything in one pot -- just doesn't back out and leave us alone and let us do what we do.

And this is -- today I heard you ask: Are you having trouble with paralleling with the utility? No, we're not. But it'll take six months for me to parallel a unit in Fresno, California, or Central California. That is not right.

By the time I do my paperwork and get everything, you know, lined up, what investor wants to sit on his investment for six months before he starts getting that revenue returned? I know of none. And these issues have been plaguing us.

And I know we're just a stone's throw -- we are located a stone's throw from hell, if you would, because -- Fresno. So we do not take the time, or people don't come to see what we're doing in that area.

I have at this point in time, and on a different subject, but I am on the collaborative board of the CEC evap direct cooling. As far back as three years ago I've done an indirect evap cooling on a Baptist Church in Selma, California, 20 miles -- I've never got a day's recognition out of that. Since then we've done two schools, one restaurant.

And there are engineers throughout the state says this system will not work. It's different than what I'm talking about, but it's all -- it just all ties together, almost disgusting.

COMMISSIONER SHARPLESS: Mr. Hopper, can you give me an idea of how big the systems are that you install?

MR. HOPPER: The one we're doing at -- well, generally our systems ranging throughout Central California, being from Santa Inez, Hancock College, which is in Santa Maria, up into Yosemite Heights. So Central California, they're 60 KWs.

At this time at the Pacific College, we're installing three 120 KWs.

To answer another question I heard you ask in reference to are these systems a part of or all the demand, I can stand corrected on the subject, but to my knowledge most of these systems that I know is being installed on microcogeneration are induction-type generators.

So you cannot cut the wires. You must have an outside source exciting these generators in order to make them work.

Now, quite honestly, we're looking heavily at going to synchronous -- I'm not even supposed to be talking that but, you know, people will find out sooner or later -- and literally cut the wires if we do not start getting more help or assistance from the utilities.

COMMISSIONER SHARPLESS: This deals with the interconnection application issue?

MR. HOPPER: Yes, ma'am.

COMMISSIONER SHARPLESS: So you are having a problem with getting interconnection applications for your projects?

MR. HOPPER: Not problem -- time. It's like -- I had a luncheon with one of the officials, and I won't name names, but nevertheless it was a matter of three to six months. Well, can I have a date? Well, three to six months.

COMMISSIONER SHARPLESS: Yes, right.

MR. HOPPER: Well, that's no answer to me.

That means -- and I can, in fact, go over this. I can get back to you and have someone from office come back and speak at one of your Committee meetings that's much better at it than I am. You could tell I kind of --

COMMISSIONER SHARPLESS: No. I think you've been doing very well. And I appreciate you coming forward.

MR. HOPPER: Well, I --

COMMISSIONER SHARPLESS: No, you've given us your very practical viewpoint of --

MR. HOPPER: Well, there's one --

COMMISSIONER SHARPLESS: -- being out in the business and doing the business. And it's very helpful --

MR. HOPPER: There is one complex --

COMMISSIONER SHARPLESS: -- to hear that perspective.

MR. HOPPER: Understand, there's one complex that even -- I can get the information to you, but I'd like you to -- I got involved back in 1982, and it's

Yosemite High. And I happen to have a chart on it.

When I got involved on it -- but there, again, we're dealing with individual people. And I think even better than that, they're located up near Yosemite so they're much relaxed and, you know, kick-backed. But at the time we got involved in that complex as a high school, they were enduring, back in '82, 18- to $20,000 power bills. Now keep in mind back then the KW cost was in at about 4 to 6 cents a KW.

I have charts dating back from there. And today they're not even reaching $10,000 a month. You know, through a continuous, complex updating, cogeneration is a part of it. But, you know, we've done EMS and --

COMMISSIONER SHARPLESS: Um-hum.

MR. HOPPER: -- it fits into heat pumps and so on and so forth.

COMMISSIONER SHARPLESS: Okay. Well, --

MR. HOPPER: So I do thank you for your time.

COMMISSIONER SHARPLESS: Right. Thank you.

Are there any questions of this witness?

Thank you very much, Mr. Hopper.

MR. HOPPER: Thank you.

COMMISSIONER SHARPLESS: We do have a Dan Whitney from SMUD who wants to talk about microgen.

MR. WHITNEY: Good morning, Commissioner Sharpless.

What I wanted to do was give you a little bit of insight to SMUD's cogeneration program and tell you a little bit about what the size of the market that we anticipate for it might be.

Our objective in having a cogeneration program is primarily to assist our customers and to make them more competitive in the businesses that they are in. We have started this originally with some very large cogen. And we've pretty well exhausted all the sizes of that in Sacramento by putting in three plants in the over-100-megawatt class. But as we got to looking at the benefits of that, that's what motivated us into the microgen arena.

What we're finding is that overall about one-tenth of one percent of our customers have the facilities and the need for waste heat that could come from a microgen application. Typically these are down --

COMMISSIONER SHARPLESS: What class is this?

MR. WHITNEY: This would be small industrial and commercial. A lot of hotels, health clubs, retirement homes, apartment complexes, and so forth. These are typically people who can use hot water in the range of 100 gallons an hour.

And if you run the numbers, for SMUD, that comes out there's only about 400 such applications in our service area. But they're very important applications to those people who are involved.

COMMISSIONER SHARPLESS: So the percentage of 100 was -- what percentage did you say it was, again?

MR. WHITNEY: One-tenth of one percent of all of our customers.

COMMISSIONER SHARPLESS: Oh, I see. Okay.

MR. WHITNEY: Which comes up in our case, for the micro case, of about 400 at the 100-gallon an hour of hot water consumption.

Typically those people would be using well under 100 kilowatts of electricity. And, in fact, the 400 cut is at the -- excuse me -- the 100-kilowatt level. So they're relatively small customers. But if you look at the list of them, it becomes very important. It's basically who's who in the economic community of Sacramento.

And I think that that experience probably shows up in other communities around the state as well. So it's a very attractive market. And it really helps those people who can afford to get into it.

COMMISSIONER SHARPLESS: So it's not just public, public agencies like --

MR. WHITNEY: Definitely not, no.

Most of the really interesting ones are like the health clubs, retirement homes, some schools, but people that have a pretty good-sized demand for hot water.

For example, a lot of apartment complexes in Sacramento have instanton hot water. You just turn the hot and it comes out immediately.

Well, you may be a quarter of a mile in an apartment complex from where the boiler is that runs year round grinding out hot water. Well, that could be done by cogeneration at a considerable improvement in efficiency, reduction in cost to the customer and all the other benefits associated.

So that's been our experience. And I think it gives you a sense of the size of this potential for a microcogeneration.

COMMISSIONER SHARPLESS: And what would your concern be for the competitiveness of this market if -- well, I guess in the SMUD area you would not be attaching a CTC?

MR. WHITNEY: No. We'll be having a CTC.

COMMISSIONER SHARPLESS: You will be having it. So what is your concern?

MR. WHITNEY: It's a different structure.

COMMISSIONER SHARPLESS: Right.

MR. WHITNEY: Well, there's no concern there. It's really -- I'm just responding to the question asked.

COMMISSIONER SHARPLESS: Right, the universe.

MR. WHITNEY: Yes.

We think that this technology will be competitive. The CTC will not last forever. Whatever effect it might have is relatively short-term.

COMMISSIONER SHARPLESS: So would you -- I recognize you're a municipality and you would be operating under somewhat different terms, but would you be applying a CTC to these microgen people?

MR. WHITNEY: That's a question of how we're going to finally market and price this. We have not developed a pricing structure, so I really can't tell you how we're going to do it. But we will have to recover the cost of doing and providing the service, definitely.

COMMISSIONER SHARPLESS: So I guess the answer you're not going to price it so that you would disadvantage this technology. You're going to see what this technology requires to make it a viable option for your customers and price it accordingly?

MR. WHITNEY: We'll price it accordingly against the market, which is the combined cost of fuel and electricity to the customer, because certainly they will pay no more than the aggregate of the two.

COMMISSIONER SHARPLESS: All right. Are there any other questions of this witness?

Thank you. Thank you very much.

Mr. Alvarez. Excuse me.

MR. ALVAREZ: Yes.

COMMISSIONER SHARPLESS: Mr. Whitney.

Mr. Alvarez.

MR. ALVAREZ: I guess perhaps if I can get just a bit of perspective. You heard the discussion about the classification of microgen as a DSM strategy?

MR. WHITNEY: Yes.

MR. ALVAREZ: Does that cause any problems for you?

MR. WHITNEY: No. Really these are less -- smaller generating of electrical load or capacity than the typical load of this class of customer. Even so we still have to match their 24-hour-a-day utilization. So there's always going to be the question of the matching.

Clearly these are on the other side of the meter, but then so are most of our customers. And we're trying to serve the interest of those customers. So it really is not a substantive issue as to whether it's demand-side management or not.

MR. ALVAREZ: Okay. Thank you.

COMMISSIONER SHARPLESS: Does Mr. Beebe also with SMUD want to testify as Mr. Whitney's testimony covering -- you're on the card as well. Did you have anything you wanted to add?

MR. BEEBE: Dan and I are together. We're --

COMMISSIONER SHARPLESS: Okay. Fine.

Mr. Hopper, did you have something you wanted to ask? Please come forward.

MR. HOPPER: Yes. I speak very highly of SMUD, so -- I've done projects for you folks. But, nevertheless, my question being if, in fact, we're not able to continue, as far as microcogeneration, my money is saying just this:

At -- the utilities will be putting in cogeneration in certain areas, not necessarily for what we're doing it for, but it will be to relieve the grids to where the grids are failing at this point in time, especially down in my area.

They have one or two choices. Either to put small units out in rural areas to shave that peak or up the grid. I see this coming back.

And I was brought into cogeneration, by the way, by a utility. I was taught the business. And so what can I tell you? But I do see it coming back if, in fact, we're put out of business between now and then.

COMMISSIONER SHARPLESS: Thank you.

MR. HOPPER: So there's only going to be one choice left again when it's over with. Thank you.

COMMISSIONER SHARPLESS: Thank you.

I think we've fairly well exhausted the microgen. Is there anybody else who hasn't filled out a blue card? Yes.

Mr. Miller, you don't need a blue card. You had a question.

MR. MILLER: Thank you.

You know, in a way I wanted, at least from my perspective, to put this, the possibility of a large amount of microgen coming in existence and say something about that.

For the *ER '94*, the Staff did a forecast of cogeneration potential. And some of that was based upon the *ER '92* numbers. Now --

COMMISSIONER SHARPLESS: Would you be more clear for the audience? You're kind of talking in nomenclature that maybe some of these folks don't know what an ER is and why we call them '92 and '94.

MR. MILLER: Okay. Every two years the Commission puts out an Electricity Report which looks at demand and supplies for electricity for the state.

And part of that process, among the array of different supply options that are looked at, is what does the future hold for the qualifying facilities. And cogeneration is part of that.

Now for the last three or four -- or actually quite a few Electricity Report cycles, the Staff has forecast the amount of cogeneration that would likely be built, which would be economic. And one step of that process is to look at the technical potential of cogeneration.

Now we did it on a generic basis. We tried to be as --

COMMISSIONER SHARPLESS: What does that mean, "technical potential" --

MR. MILLER: Well, --

COMMISSIONER SHARPLESS: -- does that mean evolving and emerging or does that marketing existing technologies?

MR. MILLER: Well, under our definition the technological potential would be the amount of cogeneration which technically would qualify under PURPA as obtaining an efficiency, overall efficiency, electric and heat, of at least forty-two and a half percent.

And so we looked at quite a few different customer categories by each major utility in the state. And for the small and medium cogeneration categories, we come up with a technical potential of about 5500 megawatts. But when we get to the next step, which is the economic potential of that, -- see, we're basically going down what -- that subset of the technology potential would be economic, we come out to, for *ER '94*, approximately 200 megawatts.

Now that was spread between PG&E, Edison, LADWP, SMUD and San Diego. Of that amount there was probably about two-thirds, I think, -- I'd have to go back and look at the numbers -- which was what we would call small and medium economic potential. And --

COMMISSIONER SHARPLESS: This was for microgen or this was for all cogen?

MR. MILLER: This would be for small cogeneration. It would probably go a little bit above the one-megawatt category.

So what I wanted to point out is that, even if all of that -- and that was basically based upon the utility tariffs in effect a couple of years, which basically is the same -- I don't think they've changed the lot -- since then.

So for this microgen, I don't think we're talking about a big explosion in facilities going in, even if there was no CTC on them, imposed on them.

So the economics basically still dictate how much is going in. And from the estimates that we've put together, it's not like there would be a landslide of microgen projects. It would basically, not putting the CTC on, I think would basically keep the economics status quo pretty much the way it is.

COMMISSIONER SHARPLESS: Well, I think that's useful information if our economic assumptions are right.

MR. MILLER: That's right.

COMMISSIONER SHARPLESS: Okay. Mr. Miller, thank you.

Are there any other points needed to be brought up on this one?

MR. MASRI: I'd like to make just a quick point --

COMMISSIONER SHARPLESS: Yes.

MR. MASRI: -- that it seems to me that AB 1890 does at least grant an early exemption from the CTC to cogen. I believe --

COMMISSIONER SHARPLESS: All cogen? If you read the Bill, it's pretty confusing. There's existing, there's new, there's something that happens after the year 2000, --

MR. MASRI: Right.

COMMISSIONER SHARPLESS: -- there's stuff that --

MR. MASRI: That's what I'm referring to, is after December -- after the year 2000, --

COMMISSIONER SHARPLESS: After June.

MR. MASRI: Yeah.

COMMISSIONER SHARPLESS: After June of 2000.

MR. MASRI: Which is about 18 months earlier than --

COMMISSIONER SHARPLESS: The rest.

MR. MASRI: -- the rest. There is already some, I suppose you could say, exemption timewise in there. I just want to make sure everybody's aware of that.

But I think what the parties are talking about are the period between now and June 30th of 2000 is the uncertainty that they're concerned about.

COMMISSIONER SHARPLESS: Right. What might fall within certain categories now and what might have to wait until later.

MR. MASRI: Right.

COMMISSIONER SHARPLESS: Okay. Thank you.

We have an individual who doesn't exactly fall within our agendized items, but needs to speak before lunch because they have to leave. I'd like to call that person forward, Jeffrey Golden.

MR. BLEES: Excuse me, Commissioner Sharpless.

COMMISSIONER SHARPLESS: Yes.

MR. BLEES: I have several --

COMMISSIONER SHARPLESS: You're on.

MR. BLEES: -- questions for the Staff following up on the discussion we've had this morning. And I think they might also engender a further discussion among some of our previous speakers.

Should we engage that now or call on this gentleman?

COMMISSIONER SHARPLESS: Let's bring Mr. Golden forward first, and then we can follow up with that.

Mr. Golden.

MR. GOLDEN: Commissioner Sharpless and Committee representatives, Staff members. I appreciate the flexibility shown here. I was made aware of this process of Workshops.

My name is Jeff Golden. I represent a company called Amoco/Enron Solar. Amoco/Enron Solar is a joint venture between AMOCO Corporation, with whom you're probably very familiar, and ENRON Corporation, which is a marketer and distributor of natural gas and now electricity.

They established a joint venture, hence called Amoco/Enron Solar, about two years ago with the strategy of capitalizing on an emerging photovoltaic and solar technology market that went beyond the traditional scope of remote sales of modules that had been in existence in some way, shape or form 20 years prior.

I would like to, if the opportunity is made available to me right now, to present to you a little bit an industrial perspective that we think can help you in guiding your use of funds in support of the renewable technologies that were discussed at the last Workshop.

In the form of a presentation that gives a snapshot of how internationally Amoco/Enron Solar is attacking a renewable energy explosion and what role the CEC can have in promoting that further development of solar technologies and photovoltaics, in particular, in California with the use of the funds that have been allocated under AB 1890.

And I have about a 10-minute presentation that uses some overheads that gets into that.

COMMISSIONER SHARPLESS: So your focus would be on one of the items that was on the Agenda where the fourth and the fifth would deal with allocation --

MR. GOLDEN: That's right.

COMMISSIONER SHARPLESS: -- criteria?

MR. GOLDEN: Yes, it would.

COMMISSIONER SHARPLESS: Okay. About 10 minutes?

MR. GOLDEN: I understand we're close to lunch and a deviation from the schedule --

COMMISSIONER SHARPLESS: If you could stay within that time period, we'd appreciate it.

MR. GOLDEN: Certainly.

And I do have copies of the presentation I'll give to the representatives and yourself --

COMMISSIONER SHARPLESS: Great.

MR. GOLDEN: -- to take with you.

As I mentioned, I'd like to talk a little bit about the emerging demand for solar energy in the context of a global renewable energy explosion that Amoco/Enron Solar has seen, both domestically and worldwide.

We see this -- we really believe at Amoco/Enron Solar that renewable energy will capture a meaningful share of the global energy market over the next quarter century. There are going to be several components that are going to drive this.

One will be increased global energy demand. Second will be increased environmental concern. And third will be falling costs.

We see this as a renewable effort that will not wheedle out one or two technologies that are renewable, but will actually incorporate a combination of solar, wind and hydro, which will be the focus of Amoco/Enron Solar that blend different resources at different points in the world, and certainly within California itself, that allowed us to capitalize on the technologies of each of those three different renewables.

That our goals will therefore be to possess the best technology in each of these fields. We need to have equity capital access to be able to continue the commercialization efforts of these renewable energies. And we need to continue to manage the costs of these technologies down.

This is kind of the foundation that we operate under. And you can see certainly -- I apologize to the audience, and I will have copies of this presentation to look at -- the numbers are -- it's a little small font here, but basically we can see a global energy demand explosion, particularly in developing countries of India and China where we have a presence, but even the United States where we can expect potentially a 20- or an even higher percent growth over the next 10 or 15 years.

Interestingly enough, corresponding to that growth in demand, we also see that the representative from British Petroleum has announced that they believe that discovery of oil is going to peak within the next 20 to 50 years, which is probably very early, relatively speaking, to what industry analysts would otherwise conclude.

The reason this is significant is this says that on top of this explosion and demand, we're really beginning to start to see tap, the peak, if you will, of the fossil fuel that has carried energy to this point.

With that extensive oil-based energy, you see the emissions that we're all very aware of. What's particularly of note to Amoco/Enron Solar is that the United States, in signing the 1992 Rio Treaty, agreed to stabilize carbon emissions.

And actually what we've seen and what we predict to continue to see is upwards of a 30-percent increase in emissions by the United States and certainly other players that have signed that agreement.

But what has come out of the following discussions, and again you can see the greenhouse emissions that we project will continue to explode as they have over the past 30 or 40 years, but more importantly what's come out of some of those meetings is a recent ministerial declaration at Geneva which says that we must -- not only do we recognize the global damage that emissions are causing, but it's about time that we introduced binding legal legislation as a collaborative group that would enforce emission control.

And the Kyoto Summit in the year 2000 is really the focal point of what measures will be introduced to accomplish that end.

Combined that potential legislative global movement with an increasing demand from the customers for green energy, what we consider green power, and certainly there have been countless studies that have introduced that, yes, people are willing to pay more for clean energy, the question is how much. And when you ask them outside of the context of a study, are they actually willing to step up and make the payment.

And that's something that we're exploring here in Los Angeles and San Diego. And I'll touch on that briefly in a minute.

With regard specifically to solar technology, wind turbines have had the luxury of a production tax credit for some period of time. And with that technology that has, to a certain extent, peaked in its technological component and really is now just being managed downward based on improvements and efficiency of current components, solar has had to take that step over 20 years primarily on its own.

Certainly there have been Department of Energy research and development efforts that have helped to subsidize that. But, to a large extent, on a commercial application there has not been smaller equivalent value production tax credits available to solar commercial efforts.

What we've seen, however, is that over time solar modules and photovoltaic modules that Amoco/Enron Solar produces have fallen dramatically, well over 50 percent in the last 10 years, to a point where we're now at a stage where we have emerged a long way from research and development and really require one last push to become competitive with wind, other renewables and even natural gas in certain applications.

One of the products that's going to carry us to that competitive level is increases in technology that are still available to solar. I speak specifically of amorphous silicon technologies.

This technology has a manufacturing aspect, much as a car-making plant or other similar manufacturing efforts have, that if we can increase the size of manufacturing facilities, we realize large gains in economies of scale. The argument is made many times, and I will not belittle it here, but rather re-emphasize it.

On top of that, however, we also have technology advancements and efficiencies in the modules that continue to improve, both on the traditional polycrystalline technologies and now also on the amorphous silicon technologies.

I will reiterate that the benefit of the emerging amorphous silicon technology is that we will recognize over a 60-percent cost savings in production of modules by transitioning to amorphous silicon from polycrystalline.

And it's not theoretical. It's real. Our manufacturing strategy is one which has completed -- a 10-megawatt production facility, as we speak, is being commemorated in Virginia officially. This will incorporate the new technology of amorphous silicon. It will expand Amoco/Enron Solar's sales from 50 million of this year to potentially 70 or 80 million next year.

But, more importantly, it is a real step taken by the industry to drive costs down to a point where, by producing more, by capturing economies of scale with a better technology, we can better compete on a commercial effort. This is not to say, however, that we can continue to do this on our own.

Our strategy is to continue on an industrial level, to pursue this new technology and lower cost structure, our solar farms, rooftops and green-power energy.

Very briefly, a solar farm is a central station, a grid-connected, solar-power system. To find a site that currently requires success for this system, we need a location obviously with good sunshine. We need a long-term power contract with long-term financing.

This is the critical component of where solar and photovoltaics stand at this point in its emergence as a commercial technology. If we are given long-term financing and a long-term contract, we can devise a financing structure that enables to hit 2 or $3 a watt for a central station system. This, in turn, allows us to generate power that is five and a half cents a kilowatt hour as we've advertised in our CSTRR project in Nevada. We have also proposed similarly competitive rates in another project in Hawaii that we're pursuing at this time.

COMMISSIONER SHARPLESS: Excuse me, Mr. Golden. What is your definition of "long-term"?

MR. GOLDEN: We traditionally seek a 20- to 30-year term. The modules that we use are warrantied for 20 years, but have a life that goes well beyond 20.

To give you a global aspect of where Amoco/Enron Solar is taking this technology, it is not R&D. It is emerging. And it's emerging in areas where these critical components of solar farms are present. We look at India. We look at China. We look at Hawaii, where the avoided cost structure allows us to capture rates that are competitive with either other renewables or natural gas and other fossil fuel sources.

We have about a 350-megawatt portfolio. And the reason I show this slide is not to tout Amoco/Enron Solar as having -- being able to talk to different countries and say, are you interested in solar.

These are contract negotiations that are ongoing that give credit to the fact that we have a cost structure that is competitive in certain applications, but is really at the threshold where programs like the CEC is pondering with distribution of funds, can make a real final push for photovoltaics and other solar technologies to become ultimately competitive in more places and to a larger extent than is currently available.

COMMISSIONER SHARPLESS: Do they give you the long-term contracts that you're looking for?

MR. GOLDEN: Yes. In India, as a matter of fact, we have a 25-year contract for a 50-megawatt photovoltaic grid-connected plant that has a levelized rate of about six and a half cents for the 25-year term.

The second way that we can attack commercialization efforts of solar is through the rooftop system. And that's really one of the reasons that I'm in Los Angeles, and I appreciate your moving the schedule up. I have to meet with some other industry potential partners on a rooftop scheme that we're looking at doing here in Los Angeles and San Diego.

With the benefit of retail wheeling, California has positioned itself to continue to take a leading role in photovoltaic development. If you look at an average consumer who uses 500 kilowatts and you take a look at the average peak kilowatt hour cost of various utilities in Southern California, you see a price of about 13.8 cents a kilowatt hour.

We have a two-kilowatt system that can be located in Los Angeles and San Diego. And the economics indicate to us that we can realize a 15-percent savings to the homeowner through a long-term leasing or refinancing structure that, to a certain extent, incorporates the term, but we will bear the risk of the term by offering it in the form of a lease.

And by doing that we can bring immediate savings in today's structure. And there are other ways that we believe that you can use these funds to further promote those savings and pass them on to the homeowner directly.

COMMISSIONER SHARPLESS: How are those savings achieved; is that for peak load or --

MR. GOLDEN: Yeah. The solar has the benefit of actually mirroring a lot of peak profiles. You put a system on your roof that generates electricity. And let's say in an average system for a 500-kilowatt-a-month homeowner you generate a 270-kilowatt hour in energy from a rooftop system of two KW size.

If you were to then utilize net metering and be able to sell that back to the utility under net metering at the retail value, if you took a look at the amount that you would spend on the electricity bill, less the net metering effect, less the leasing cost that we would offer to the consumer, your ultimate energy bill would see potentially a 15-percent savings.

In other words, the customer would pay Amoco/Enron Solar to lease the system. They would realize the savings associated with the sale-back of the energy they generated from the rooftop system. And that nets out to about 15-percent --

COMMISSIONER SHARPLESS: What are you assuming the sell-back rate would be?

MR. GOLDEN: The sell-back rate would be whatever the existing peak rate is at the time the energy is generated. And the solar profile happens to match the majority of the utilities in Southern California's profile for peak demand. And what we did to illustrate this example was to take an average of various utilities' peak rates that that energy may fall into.

COMMISSIONER SHARPLESS: Okay.

MR. GOLDEN: Another interesting aspect that California has in the midst of this global development is that California actually is an importer, each year, of about 27 gigawatt hours of electricity.

I won't harp on the fact that there has been some talk of destabilization of the grid structure, that no doubt you have experienced firsthand when certain trips occur at points in the Western Grid.

NERC is projecting you to continue as California to be a net importer and potentially to double your import levels of electricity over the next 10 years. This is going to continue to add strains on your -- the stability of your system.

And we think that there is an opportunity here that California has to start tapping on more of its natural indigenous renewable resources to enhance stability and at the same time promote the emergence of photovoltaic technology.

For example, in 1995 California imported 28-gigawatt hours of electricity. That importation is equivalent to 11,530 megawatts of solar farms. Now I'm not standing before you to say that we have the capacity to build that tomorrow.

However, when you put that in perspective, that requires 180 square miles of land. If you look in the Mojave Desert that has insulation ratings that are capable of generating that amount of electricity, you're looking at an area well above

2100 square miles.

Certainly there is the indigenous resource available to California to reduce imports of electricity, to firm up system through distributor benefits, and simultaneously to promote a resource that very few other states have available to them.

Along those lines, I'll get to the punch line, certainly I understand there's much discussion on how the distribution of funds should be allocated amongst renewables. And my point is certainly to promote photovoltaics. I will leave that as no doubt. But I understand the complications of addressing all the renewable energy demands and needs.

Using this as an example, however, if we just took a look at 25 percent for discussion purposes, and saw that that was about $33 million a year, one of the efforts that has had a huge success has occurred in Nevada, which is CSTRR.

CSTRR is the Corporation for Solar Technology and Renewable Energy Development that was created by the Department of Energy. We think the California Energy Commission has the opportunity to create a similar program in California.

CSTRR was charged with the mission of identifying federal, state or other facilities that are high-cost users of energy. They would then create a solar enterprise zone, which they have done, in central Nevada, that would generate cost competitive electricity to current prices that those facilities were using and offer solar as an alternative and distribute that power to those facilities.

The theory being that they could either reduce or meet current high-cost user prices and further promote photovoltaic and solar technology development at the same time.

We think that with $33 million you have the ability to promote commercial efforts substantially by offering the two critical components that we currently require to be successful. One is long-term financing, which from this pool of money you could selectively prioritize projects that you felt the state, either state facilities, Department of Corrections, for example, et cetera, that expressed an interest in renewables and were high-cost users of power in good sunshine locations, could use, that you would provide debt financing which could be at a tax-exempt equivalent rate, over a long period of time, to allow us to more quickly enter into some of these potential projects that we're looking at.

The second way that we see that happening is through promotion of rooftop system sales, which I believe was discussed at one of the last Workshops. The key here is that, in promoting this, you want to get savings to the consumer, but you want to promote continued production of more photovoltaic systems so that you drive, continue to drive down the cost of that technology, which is the critical aspect.

In Japan they have created a program which you're probably very familiar with that MITI has agreed to subsidize 50 percent of an $8 a watt system for homeowners. And they just recently made an amendment to that policy that allows that 50 percent to go to the producer or the installer of the system.

COMMISSIONER SHARPLESS: That's 50 percent of what?

MR. GOLDEN: Fifty percent of the $8 a watt.

COMMISSIONER SHARPLESS: Okay.

MR. GOLDEN: So you're talking a pretty substantial amount of money that MITI -- MITI has the target of putting 4600 megawatts of solar in Japan before the Kyoto Summit.

I don't think the production abilities are going to let them hit that. But they have a very aggressive stance in promoting rooftop applications and photovoltaics in particular.

And we see that you now have the opportunity in California to implement a similar program whereby you are passing savings on to the consumer in the form of a subsidy that reduces the cost to the consumer that, as has been discussed, increases the payback time and it also allows an increase in demand so that more of these products can be generated.

By generating more of these products, you reduce the need for a subsidy, whereby companies can offer it at a lower-priced cost because module prices continue to slide. So --

COMMISSIONER SHARPLESS: I have to ask you to wrap up, Mr.

Golden.

MR. GOLDEN: That's right. And actually that was my last slide.

I appreciate the Commission -- Commissioner, your slipping the schedule again. And if there are any questions either now or at a future date, I'd be glad to address those.

COMMISSIONER SHARPLESS: Thank you.

Well, one principal question that we talked about in our last Workshop was how you would define "emerging."

MR. GOLDEN: The interesting part of solar is that, as opposed to other renewable technologies, I would argue there is a plethora of technologies that use a different, an inherently different approach to capturing solar and generating electricity from solar.

There are chemical processes, there are thermal processes, there are collector processes. There's a vast array of potential technologies that could be ultimately the best. Who decides what the best is or where that stands on an emerging scale is certainly something that's open to debate.

We think that if you look at those that are emerging, photovoltaics has a 20-year life. AMOCO has personally invested $400 million over a 20-year period in photovoltaic development. We have since added another $60 million in its development. And we think that, if you talk amongst industry experts, you can see that photovoltaics has a proven track record and it's commercially shown that it works.

COMMISSIONER SHARPLESS: So in that sense "emerging" would be it's commercialized, but you need to bring the price down in order to make it competitive?

MR. GOLDEN: That's right. I would define "emerging" as a technology which has the potential to realize cost savings, not from hypothetical advances in technology per se, but more through a process that's proven to work and how manufacturing or adjustments to the production of that technology can be driven down in a commercial environment.

COMMISSIONER SHARPLESS: The other -- and I think this deserves certainly more discussion than I think we're going to do day, because we're going to have another Workshop on the 19th and the 26th that you may want to focus on and provide more information to the Committee. And I invite you to do that.

But with respect to your presentation today, many of the options that you've been offering to the Committee appear to require funding beyond what we would consider a four-year period. So that would be some kind of a revolving fund.

I get the impression, Mr. Golden, I don't want to put words in your mouth, but you feel the effort to support this emerging would be ongoing; is that correct?

MR. GOLDEN: Well, I think we're at a critical point where, you know, solar has come from $10 a watt to $4 a watt. And, in some cases, we think through mass production we're going to see before the year 2000 that fall below $2 a watt, to a large part because of amorphous technologies' ability to begin mass production, from a research and development standpoint to a manufacturing, line-type style production.

To the extent that there are mechanisms in place to facilitate that trended, which will certainly occur much slower without the assistance of these types of programs, I wouldn't say that -- I don't want to say that the absence of this program would prevent us from doing that, but I think the realization period would be a lot longer.

COMMISSIONER SHARPLESS: How would this program meet your concerns to meet equity capital assets?

MR. GOLDEN: If you look at a $33 million pool of money that can be offered over a long period of time at an interest rate that's competitive with tax-exempt financing rates, you could use the interest to promote those other emerging solar technologies through their research and development to commercialization phase, and thus sustaining the fund to a certain extent.

But you could also take a significant chunk of the debt portion of a project and offer it at competitive rates, thus satisfying our requirement for capital.

COMMISSIONER SHARPLESS: And that would be given to the facility owner?

MR. GOLDEN: That's right. Well, that would be given to the person that was implementing a project.

If the Department of Corrections, for example, approached the California Energy Commission and said they were interested in *X* megawatts of central-station distributed systems at their facility, then there would be a process to select somebody to do that project with the understanding that, with that acceptance, they could have access to a portion of the funds that were set aside for that type of debt financing.

COMMISSIONER SHARPLESS: Is that $33 million also intended to buy down some of the cost to the customers, or is that $33 million that you're talking about purely to go to project owners or operators?

MR. GOLDEN: The way I currently envisioned it was to go down to the project developer to use in financing a current project under the assumption that, if you take a look at a capital cost of 2 to $3 and you're able to get long-term financing at these rates, there's a certain price, which is about 5 and a half to 6 cents a kilowatt hour rate now, that the customer would be willing to pay.

To the extent that we realize further economies of scale, that 2 to $3 a watt now transitions to somewhere below 2. And that may not allow you to realize savings directly to this customer today. So there may be worth looking at a structure that would also allow that.

But really the crux will lie with the ability to promote further production of a technology that has a proven itself and that really requires economies of scale associated with mass production to continue that drive of costs.

COMMISSIONER SHARPLESS: But the answer to your question -- or my question is the $33 million would be some kind of account that would continue?

MR. GOLDEN: It would be a capital fund that could be interest-generating. We've suggested one of the potential uses of that interest be to promote other solar technologies that were not at the same point of commercialization as photovoltaics or whatever is at that point.

COMMISSIONER SHARPLESS: Okay.

MR. GOLDEN: But, yes, it would be self-sustaining.

COMMISSIONER SHARPLESS: Well, that's an interesting proposal. I think that we'll have to provide further information, discussion.

Are there any comments by Staff? Mr. Alvarez, and then Mr. Schwent.

MR. ALVAREZ: I guess I have a question on one of your comments. You talked about one last push to be competitive. And I'm curious of what kind of criteria or what kind of assurances could you provide the Commission that we are, in fact, involved in an activity that is one last push to a competitive market?

MR. GOLDEN: Well, as I mentioned, two of the critical components to solar farm projects are long-term financing for a long-term power contract at competitive interest rates.

To the extent that the California Energy Commission has access to funds that could be used to satisfy that financing criteria, you're an integral part of making that happen.

To the extent that the process also allows you to address those state or federal agencies in California that express an interest in renewables, you're really tackling two issues at once.

I'm sorry if that did --

MR. ALVAREZ: I'm not clear. I guess I'm still -- how do I cross that bridge? I understand how I can use funds that we have to help a particular project appear economically viable that perhaps isn't.

I guess what I'm asking is how do I then transcend that idea of an individual project to the idea that I can make this industry-competitive in the long term without the subsidies?

MR. GOLDEN: Right. We are currently projecting at Amoco/Enron Solar that we will increase our amorphous silicon module production capacity to above 25 megawatts by the end of the decade. That will result in probably another 50-percent reduction in the cost of our modules.

We have to have a market for those modules. To the extent that we can identify projects that we can finance and build between now and then or get under contract and begin construction, we will justify those increases in manufacturing and subsequently realize the projected savings in costs, which are not dependent on another technology discovery. It's really dependent upon building a manufacturing facility of a certain size.

MR. ALVAREZ: But your strategy here to get those 25 megawatts in place is already premised on some notion that, in fact, the market would be in existence and the financing wouldn't be there.

I mean you didn't plan that strategy on the account of 1890 being passed or being available?

MR. GOLDEN: No. That's very correct.

And what 1890, with these funds, can do is get us to a point where, say, if we actually now have a production cost that's below $2 a watt, now we can probably do a project at commercial-financing terms that are more consistent with, say, other IPPs that use natural gas or fossil fuels, that we wouldn't require the special treatment of long-term special-rate financing.

That now, as a result of the financing that's made available today under those terms, we can move down our cost curve to a point where we have a project cost that allows us to commercially finance at regular, say, 8, 9, 10 percent rates over more shorter periods of time.

MR. ALVAREZ: I understood your strategy on the long-term contracts and a power sales agreement, long-term financing of your rooftop commercialization. I guess I don't understand your strategy on the green marketing.

MR. GOLDEN: Yeah. For time sake I pulled those slides.

MR. ALVAREZ: Okay.

MR. GOLDEN: But essentially what we're trying to do is, in working with CSTRR, they have a vision of identifying federal facilities nationwide, which would -- through wholesale distributors, we could generate solar where it makes sense to generate solar, Nevada, Southern California, where there's excellent sunshine.

And through wholesale marketing we could deliver that green power to clients in New Hampshire, to federal facilities in Michigan, to locations elsewhere in the United States based on current -- ENRON Capital and Trade, for example, who I'm partial to, because it's part of ENRON, has a billion-dollar infrastructure that swaps, trades and wheels electrons to accomplish that end.

We see that available now today on the wholesale level. And with deregulation that will certainly become available on the retail level.

MR. ALVAREZ: Okay. So, in essence, the power would still go into the utility, in which is located -- but you would hedge and basically --

MR. GOLDEN: We would work with the power marketer.

MR. ALVAREZ: -- work with the power market to trade those electrons.

MR. GOLDEN: That's right. We would partner with a power marketer that could move those electrons kilowatt hour for kilowatt hour to prospective clients.

MR. ALVAREZ: Okay. Thank you.

I have no other questions.

COMMISSIONER SHARPLESS: Mr. Schwent.

MR. SCHWENT: Commissioner, with regard to your questions about financing, I just mention to you that, of course, the Bill does require that we take a look at financing mechanisms as a way to stretch the money.

Staff has formed a group recently. We've begun exploring some mechanisms, possible mechanisms, for how we could provide some low-income -- or low-interest, rather, rate money. And it wouldn't necessarily involve having to take a block of funds from AB 1890 and commit those on a long-term basis in the form of low-interest loans.

We're exploring possibilities where perhaps one could just make loans and then refinance those loans through something like the Alternative Energy Financing Authority, so in essence that money gets recycled on a very quick basis.

So there are some ways, I think, perhaps -- we're exploring them -- to make low-interest loans to PV or any technology and not be able to tie up large amounts of this precious money for long periods of time.

COMMISSIONER SHARPLESS: But it's not part of the 1890 540?

MR. SCHWENT: Well, the notion would be that, if anything, we might have to take a piece of it, as C capital perhaps, make a loan or a series of loans and then take those loans, once they've made, and then refinance them through an existing financing authority, such as CAVSA [phonetic], get our money back.

And then that money would be available to be used again to make lower loans or to be used for some other purpose appropriate to 1890.

MR. GOLDEN: I believe it's very similar to a mortgage-type structure, where your mortgage can be bought and sold.

MR. SCHWENT: We'd have a secondary market, so to speak, for our low-interest loans.

COMMISSIONER SHARPLESS: Thank you.

Any other questions?

Thank you very much, Mr. Golden.

MR. GOLDEN: I appreciate your adjustment to the schedule.

COMMISSIONER SHARPLESS: Surely. Now I'd like to return to Mr. Blees. Mr. Blees, you had some questions that you wanted to --

MR. BLEES: I have a feeling that this may take more than just two or three minutes.

COMMISSIONER SHARPLESS: No. I was actually going to allow you to -- okay. Well, then the better plan would be to do this after lunch. I thought perhaps you could --

MR. BLEES: Well, I mean we can get started and see.

COMMISSIONER SHARPLESS: I was going to break at about 12:35 maybe.

MR. BLEES: Let's go.

COMMISSIONER SHARPLESS: Do you want to start it?

MR. BLEES: Sure.

COMMISSIONER SHARPLESS: Okay. Let's.

MR. BLEES: I'm anticipating there may be response from people other than the Staff --

COMMISSIONER SHARPLESS: Right.

MR. BLEES: -- and if there's not, then all right.

COMMISSIONER SHARPLESS: Then they can anticipate it and come after lunch.

MR. BLEES: Mr. Masri, Sections 371 and 372 of AB 1890 describe the conditions under which load reduction through cogeneration escapes the CTC; is that right?

MR. MASRI: That is correct -- 371 does. And I also believe 37- -- yes.

MR. BLEES: Okay. And those two sections don't exclude microcogeneration or cogeneration using pollution from the general category of cogeneration, do they? I mean 371 and 372 apply to cogeneration --

MR. MASRI: In general.

MR. BLEES: -- across the board, right?

MR. MASRI: That is correct. And to me that means it includes all cogeneration, including these two categories that we are discussing today, microgen and cogeneration that uses VOC as a fuel.

MR. BLEES: So if a microcogeneration facility or a cogen facility using pollution meets the criteria in 372, then that facility, or the customer it serves, will be exempt from the CTC, right?

MR. MASRI: That would be my interpretation of that, yes.

Now 371 does not talk about new cogeneration. It talks about equipment that increases the efficiency of existing self-generation cogeneration. So to the extent that it's existing stuff that we're talking about that's being enhanced or expanded, I'm not sure that -- at least 371(b) includes new installations of cogen.

MR. BLEES: Right. Well, I think that I would agree with that. But to the extent that a new microgen or a new pollution-using cogen is not included in 371(b), all other types of cogeneration are also not included? In other words, --

MR. MASRI: Right.

MR. BLEES: -- whatever it says about microgen, it also says about all other types of cogen?

MR. MASRI: Yes. That section, in my mind, applies to all types of cogen, yes.

MR. BLEES: So I wonder then if the question about microgen and cogen using pollution boils down to why should those two types of cogeneration get special treatment that all other types of cogeneration do not get? Could you address that?

MR. MASRI: I don't think we see any special reason why these two should be any -- have special characteristics that would indicate that they should receive any special treatment as a substitutive cogen.

When I spoke about the Energy Commission designating cogeneration as opportunity technology, it's cogeneration, period. And it's not really -- does not distinguish between a small or large as one being better than other and therefore one needs more support.

I don't see on the face of it that these two special categories of cogen are necessarily -- have special circumstances that differ from the rest of cogen that would warrant such a treatment, as I read the Bill.

MR. BLEES: And does Staff intend to address that question head-on at a later time, whether those two particular types of cogen have economic or environmental or other advantages or certain types of competitive needs that distinguish them from other types of cogeneration that would justify special treatment?

MR. MASRI: I think in drafting the section report that responds to this requirement, the legislation would have to look at those two specific types, yes, and see if they do qualify.

Now the Bill talks about the policy of the state is to encourage and support the development of cogeneration. Again, the thrust is really cogeneration. But then we're asked to look at these two specific categories.

And, of course, part of looking at that is to see whether there are some special characteristics for these two that don't apply to the rest of cogeneration that may warrant special treatment.

MR. BLEES: There was also a discussion several times about whether or not cogeneration is demand-side management. And I'm not sure I heard whether or not the Staff views the cogen as the type of DSM -- is cogen DSM?

MR. MASRI: I don't think I can respond to that directly. I don't know.

I think we probably want to check with our Staff in the Efficiency Division to see what their view of that is, that they deal with that. But we will do that and maybe report back at a future Workshop.

COMMISSIONER SHARPLESS: I do have to recognize, Mr. Blees, that that was part of the discussion today. And there have been arguments given by those who are raising this issue to the Committee that, in fact, there are ways to look at the smaller microgen as DSM and how the 1890 treats DSM with respect to competitive transition charge.

So there has been, as I know you know, a recognition, but that you were asking Staff directly for their opinion.

MR. BLEES: And it may be unfair to ask these Staff as opposed to the Efficiency Division --

COMMISSIONER SHARPLESS: Right.

MR. BLEES: -- I mean obviously you'll discuss that with them.

Do any of the earlier speakers wish to respond to anything that Marwan had to say?

COMMISSIONER SHARPLESS: Yes. Are there two? Traci and -- okay.

Why don't you just come up and make your comments, if you wish?

MS. BONE: Traci Bone again for Texas-Ohio Power -- or Texas-Ohio Energy.

And I know that you're the attorney on the Staff, but I don't recall your name. He's sitting over there.

MR. BLEES: Jonathan Blees.

MS. BONE: Jonathan, to respond to your questions, the reason that the VOCgen or VOCgen-type technology should receive special treatment as opposed to larger cogeneration units is because the VOCgen is more than a cogenerator.

The cogeneration -- what it does is it replaces what pollution control devices that previously merely incinerated VOCs. And it takes the VOCs and it not only destroys them in compliance with the air quality requirements, but it also produces electricity. So it's a far more efficient system that what is currently available.

Does that respond to your question?

MR. BLEES: It sounds like it's highly efficient and it's great for the environment. Why can't you compete right now? Why do you need some extra special subsidy, and what justifies that subsidy?

MS. BONE: We're not asking for a subsidy. What we're asking for is that we be classified so that we are not subject to CTC exemptions. And perhaps -- to CTC, I'm sorry.

And perhaps, in your mind, those are the same things. But the fact is that prior to December 20th, 1995 anybody could go out and by a VOCgen, and it would be competitive against the utility purchases that it offset.

It is merely because we've moved into a restructured electric market with accelerated recovery of CTC that the VOCgen cannot compete in the market for the next six years, until CTC is fully recovered.

And we don't believe that it makes sense to delay the implementation of technologies of this type which have been developed primarily to meet air quality control requirements in a more efficient way than merely using gas to burn VOCs or other types of pollutants.

MR. BLEES: If a customer -- well, first of all, that problem that before December 20th, 1995 people could buy a VOCgen and after then, you know, they're still going to be subject to the CTC. That is applicable to all forms of cogeneration, is it not?

MS. BONE: That is true at this point, to all forms of self-generation, I should say.

MR. BLEES: Right, right.

If a customer -- if I buy a VOCgen today, okay, and the Legislature decides that I don't have to pay the CTC, because I bought a VOCgen, other customers are going to pay more on the CTC portion of their bill, right? I mean the CTC is going to be a fixed sum. And if I pay less, you're going to have to pay more, right?

MS. BONE: That is true, but the other --

MR. BLEES: Can you provide this Commission with an economic analysis that shows that society as a whole is better off if you pick up the extra CTC and I don't, because I bought a VOCgen?

MS. BONE: Well, --

MR. BLEES: That seems to be the fundamental question, here is if society shifts costs from me to you, by exempting me from the CTC because I bought a VOCgen, is society getting at least an equivalent amount of benefit? Are you and all the other customers who pick up the extra CTC getting benefit for that? Can you provide that kind of economic analysis?

MS. BONE: I don't know if we can. What I can say to you is that society put a requirement on us that we limit the types of emissions that we do, and we have to pay for those. And right now what we're doing is burning these VOCs using a thermal oxidizer. And so we are already paying a societal cost.

And what we're asking is that society cooperate with us in the costs that we're paying to run our business and allow us to do it in the most efficient way possible. And I think that everybody benefits from these kind of market-driven responses to dealing with meeting environmental requirements.

COMMISSIONER SHARPLESS: Also one of the reverses that I think you did say you would supply to the Committee, the reverse of that question is would you become uncompetitive if you didn't receive the CTC exemption status.

And that's probably asking the same question in a different way because if you became uncompetitive, then the benefits from your particular type of technology would not be available to those who choose to use them, who choose that that's the more cost effective way to reduce emissions.

So it may be two sides of the same coin. I'm not sure.

MS. BONE: There are societal costs and benefits on both sides. And what we can do is provide you numbers that will give you an indication of how big of a market there is in California for this kind of product over the next six years, which can give you an idea of perhaps what the CTC exemption will cost.

And I think it's really de minimis when you measure it against the benefits that will be received both from the people who are using the VOCgen and from society which benefits from cleaner air.

COMMISSIONER SHARPLESS: Thank you.

MS. BONE: You're welcome.

COMMISSIONER SHARPLESS: I believe there was another witness who wished to respond.

MR. RAFFESBERGER: Yeah, I'll try to.

Really the answer to your question is back in my remarks relating to the legislative intent. There is a difference between microcogeneration and cogeneration in general. That difference was recognized by the Legislature when they put language in this Bill specifically addressing microcogeneration. It was not there before. It was not in any of the drafts.

The suggestion -- not the suggestion -- the legislative direction to the Energy Commission to even talk about this subject was not in there. The language about going with an utility or having an electrical company go to the CPUC and talk about financing mechanisms was not in there.

Those things occurred -- and the definition of microcogeneration is less than one megawatt. Those things occurred during the various drafts in that two-week period in August when I was addressing the Conference Committee.

I'm neither trying to take the credit or the blame, but that happens to be the fact. You have to go back and look at the legislative intent. Again, as Senator Peace said -- and I might be putting a little bit more history, and I'll try not to be too long-winded about this -- but I did try to find out what happened with all the folks that were at the table, the environmental groups, the utilities, the UCAN, people like that, who were sitting around the table for up to a year prior to the time the Conference Committee met.

I talked to a lot of those people in trying to get up to speed in August. Without expectation they told me that when the process started cogeneration was exempt, straight exempt, all cogeneration was exempt.

I'm not going to try to guess as to how we got to the point we got. But when I got there on the table was a bill that would have made a policy of two policies in California, essentially Northern California, PG&E's territory cogen would have been exempt. It was written right into the Bill, the draft of the Bill. And down in SDG&E, in Edison's territory, it would not have been.

The Legislature then modified that and went to a policy where it was one policy for the entire state, but an electrical corporation could go to the state, could go to the CPUC and apply for an exemption or a funding mechanism.

I go back into that to try and explain that there was a dynamic going on. It was a moving target. The reason microcogeneration is different is because, as I explained to them, and the reason that cogeneration, large cogeneration agreed to the Bill prior to my getting there, was that no one had planned in Southern California to do 25-megawatt, 50-megawatt power plants.

They had polled their members, the California Cogeneration Council. No one was going to do a plant.

There were some cogeneration plants they were aware of, much larger than our size, that were planned in Northern California. And, as a result, they decided on a split policy. But, again, those are cogenerators that are very large. They are much larger, up to 500 times larger than our product.

What I did, I think, is explain and get some understanding from the Legislature that microcogeneration is a separate kind of industry.

And that's when I found support among all of the environmental groups that were sitting at the table. People like the Western State Petroleum Association, people like the Independent Power Producers stood up one after another and agreed with me in testifying to the Committee that our product is different, our product was never considered during the discussions because they simply forgot about it.

Our product is a demand-side product, as all of those people stood up and testified to the Committee. The Committee then directed Staff to put the kind of language in the Bill that requires us all to be here today.

We are not the same, despite -- and I appreciate the fact you're looking at the literal language of the Bill. But, as you know, as an attorney, the literal language is one thing.

But when you get into interpretation, you've got to go back to the legislative intent. You have to go back and look at the history of how we got here. It is different. It is fundamentally different.

And there's absolutely no reason, in my mind, when you go through the litany of products that are in Section 371, why we wouldn't be in there, new microcogeneration.

What's in there, as you know, are things like enhancement or increased efficiency of current equipment, fuel switching, installation of fuel cells, installation of demand-side management equipment or facilities, energy conservation efforts. And then the somewhat nebulous "other similar efforts."

Also in there is replacement microcogeneration of any size, as you correctly pointed out. But the point of that is new microcogeneration is absolutely no different than a lighting energy efficiency retrofit, or any other product that a business or a facility, a public facility, could use to reduce its load. They should not be punished by CTCs for being energy efficient and reducing their load.

MR. BLEES: I guess I'm failing to understand something, because it seems to me that there is a fundamental difference between, as you put it, a lighting program that would actually, either by reducing the total number of lights or by increasing the efficiency of the lights, that would actually reduce your total electricity load.

MR. RAFFESBERGER: Correct.

MR. BLEES: If you put in a cogeneration facility, where all you are doing is you are not reducing the total amount of electricity used onsite, you are merely shifting part of the load from being served by the utility to being served by your own inhouse generating system.

So I guess I'm failing to see how you say that it's the same as an efficiency thing.

MR. RAFFESBERGER: Either way, sir, you're reducing the demand from the utility. You're helping that utility actually, in effect, be more efficient, be more reliable as a grid.

You're not requiring them to provide you that reduced-load amount, you're doing it yourself. Those are the reasons why cogeneration for two decades in this country has been favored in public policy.

It's an energy-efficiency and conservation tool, as you know, that should still be favored.

Again, we are not asking for a subsidy. We're not asking to dive into the pool with the other renewables and argue about who gets how much money. We are not asking for special treatment.

We are only asking for status quo. We are only asking to be examined as the kind of product we are, a demand-side management product that allows the small businesses and public facilities on micro projects.

Not predicated on selling power back to utilities. Not predicated on competing directly head to head with utilities. We're simply another tool, another arrow in the quiver, so to speak, of what small business in California hopefully will have at its disposal as part of deregulation.

And the point about the relief now is if you, as Traci Bone suggested a minute ago, if in this interim next several years, you don't have that kind of relief, it is problematical whether some of these micro industries like ours, or perhaps hers, survive long enough to get to that period -- deregulated point, when CTCs and another things go away.

I don't know whether we survive in the new world, five, six, seven, eight years from now. We'll face that bridge when we come to it. I'm talking about the interim period. I'm talking about just leaving us alone at a level playing field to try to continue as we are.

I hope I've answered the difference.

The Legislature clearly recognized a fundamental distinction between large cogeneration and microcogeneration, and changed the Bill accordingly.

COMMISSIONER SHARPLESS: Thank you.

I would like to break for lunch at this time, a little beyond where we were.

The next item on the agenda will be a discussion of fuel cells. I only see one card at this point that deals with this issue.

So if there are others in the audience that wish to deal with the issue of fuel cells as fuel switching, I surely invite them to please sign up on a blue card. And we'll take that up as first order of business.

We'll break now. It's a quarter to 1:00. We'll be back here at a quarter to 2:00. Thank you.

[Luncheon break taken from 12:45 to 1:53 p.m.]

COMMISSIONER SHARPLESS: Good afternoon.

Seems some folks are still at lunch, but I'd like to begin.

As I announced before we broke for the lunch, the next item on our agenda deals with fuel cells being treated as fuel switching for purposes of exemption from the CTC. I believe the only speaker that I see that has filled out a card is Bud Beebe from SMUD.

MR. BEEBE: Good afternoon, Commissioner Sharpless.

As the legislation is written, the CEC could decide to do nothing on this topic and fuel cells would sail through as being exempt from the CTC. And that's what we would like to see happen.

We just need to assure that somebody is on record as saying that this is a bold and an important move. Fuel cells are here. That is to say they are available. I just went out and looked at one of the PC 25s out in the back parking lot here.

But they're in small quantities. We don't have gobs and gobs of them. It's not likely to be a big change. It won't change the cost of a barrel of oil in the time that the CTC is upon us.

But they are at the doorstep. And this is an important time in their commercialization. We need to make that pathway, I believe, as open as possible because they bring with them a number of benefits.

As you know, or I hope you certainly do, fuel cells are potentially compatible with the way we live each day. They can produce energy both efficiently and quietly and with little or no pollution, an important point.

Also -- and I think that this is often overlooked -- being a direct-current technology they have an interesting potential interplay with photovoltaics.

Both of those technologies need good inverter, good cheap, solid good quality inverter technology to go with them to make them compatible with our other infrastructure issues. And I think that they'll help each other to become commercially viable as they grow together.

So that's just the nuts of it.

I'm a positive supporter of allowing this pass through and to not require any CTC charges for electricity produced by fuel cells.

COMMISSIONER SHARPLESS: Thank you, Mr. Beebe.

What is the predominant fuel for a fuel cell?

MR. BEEBE: The predominant fuels for fuel cells today are either hydrogen, which is derived typically from natural gas or natural gas itself.

Fuel cell is a technology that can run on a number of different fuels including carbon monoxide and things that we don't normally associate with life on earth. But -- and in that sense fuel cells are not themselves a renewable technology.

They do, however, portend an enabling technology for some technologies, renewable technologies, in the future.

As you know, a number of renewable technologies are diurnal in nature or seasonal in nature. And at some point down the road we are going have to have a way of utilizing renewable energy both at night and during the day. And fuel cells will be a participant in that grand energy market of the future. So --

COMMISSIONER SHARPLESS: The language of that provision specifically refers to fuel cells, however, as being considered as a form of fuel switching. But predominantly they currently use natural gas?

MR. BEEBE: That's correct.

COMMISSIONER SHARPLESS: So would you say that it's accurate to describe fuel cells as a form of fuel switching?

MR. BEEBE: I have to profess a certain naivete with the term "fuel switching." I know that there is a lot of existing practice that has to do with fuel switching. And I don't want to get crosswise with that.

Let me explain it a different way.

If you were to produce electricity with a fuel cell, first of all, over the next four or five years it's going to be in small quantities. But, secondly, if you produce electricity with a fuel cell, you most likely would be using natural gas the primary fuel source today.

But you may also -- most of the applications that we see coming down the line probably would also use it as a cogeneration source. So there would be some payback from the heat portion.

If by fuel switching you're trying to say that it's a natural gas resource, I don't know that I would buy into that completely.

COMMISSIONER SHARPLESS: Given the fact that other sources can be used, other fuel sources can be used?

MR. BEEBE: That's correct.

COMMISSIONER SHARPLESS: What would you say the predominant fuel source for the market today is?

MR. BEEBE: Natural gas.

COMMISSIONER SHARPLESS: Natural gas.

Thank you, Mr. Beebe.

MS. SHAPIRO: I have a question.

MR. BEEBE: Sure.

MS. SHAPIRO: Do you expect that fuel cells with be exempt from SMUD's CTC?

MR. BEEBE: I don't know.

As you well know, we are in the process of deciding of sort of business strategy to follow in the future. It's the subject of public hearings now. And what the outcome of that will be and whether this is a specific provision therein, I cannot tell.

MS. SHAPIRO: Will you be advocating it before your Board?

MR. BEEBE: I personally would do that, yes.

MS. SHAPIRO: Thank you.

MR. BEEBE: Um-hum.

COMMISSIONER SHARPLESS: Are there any comments that Staff would like to make on this issue?

Yes, Mr. Miller.

MR. MILLER: Thank you.

I think a couple points, and I think Mr. Beebe was talking about the fuel cells being an enabling technology from the perspective that, you know, there's been a lot of talk about using photovoltaics in the future to produce hydrogen, well, that's, you know, a logical fuel for the fuel cell, too.

So because they are an enabling technology, which could potentially use a biogas or some other gas that may be from a biomass operation, there is the -- by allowing them to be considered a potential fuel switching technology you're allowing that technology to grow, and potentially promoting other types of fuels in the future to be used for fuel cells.

The other aspect too is that they are a demand side, like microcogeneration or cogeneration, a demand-side technology, which, because customers would potentially install them, ideally, for a cogeneration application, where they could use the hot water produced from the fuel cell too, that you could look at them as -- if they can achieve an efficiency of -- as, an example, of 68 percent, which I've seen some numbers, that they actually could be reducing overall energy consumption.

So that's another aspect of the -- that I think could be looked at when you're considering fuel cells as -- you know, in the future being a fuel-switching technology.

COMMISSIONER SHARPLESS: So perhaps the people who wrote the language were looking well ahead of where the technology is today?

MR. MILLER: That would be -- I'm sure that's a good conclusion.

The only -- to my knowledge, the only manufacturer today that's -- the fuel cell that's commercially available is the ONSI fuel cell, which is the 200 KW, which has a, you know, fairly limited market. Not everybody could use that size, especially if they're smaller than that.

So you're not going to see a major increase, you know, even in the next four years potentially of the technology growing just because there are not any commercially-available units out there.

COMMISSIONER SHARPLESS: Are there any other questions?

Comments by Staff?

Yes, Mr. Blees.

MR. BLEES: I have a question for the Staff that's actually along the same lines of the questions I asked earlier.

Mr. Miller or Mr. Masri, Section 371(b) says that installation of a new fuel cell qualifies the facility for a reduction in CTC unless the Energy Commission makes a contrary determination.

What is it about a fuel cell, economically or environmentally or otherwise, that should lead this Commission to distinguish it from a new cogeneration facility?

In other words, I'm a customer. I can put in a fuel cell that uses natural gas and reduce my electricity load by 50 percent and my CTC is reduced by 50 percent. But if I put in a new VOCgen that reduces my electricity use by 50 percent -- excuse me -- a new VOCgen using natural gas -- excuse me. Forget the VOCgen. Let me use microgen.

I put in a new microgen that uses natural gas, the same fuel. It uses natural gas. It reduces my electricity load by 50 percent. My CTC doesn't go down.

What distinguishes the fuel cell from the microgen? Or from any other cogen for that matter?

MR. MILLER: Fuel cells would have the potential of being less polluting than the microgen unit if you're using hydrogen.

Even if you had a reformer which would reform natural gas, you're talking about potentially less emissions even with the reformer.

If they're using hydrogen, you get the distilled water as your exhaust, so you've got a lot of -- from an environmental perspective, you've got some potentially big advantages that we could take advantage of.

MR. BLEES: Will Staff be presenting some numerical analysis that shows that there are economic or environmental differences that distinguish fuel cells from cogen --

MS. SHAPIRO: Microgen.

MR. BLEES: Well, any cogen for that matter?

Yeah, microgen or any cogen which would justify that distinction for the CTC exemption?

MR. MILLER: We have some reports that we could reference, potentially. I would have to go back and look through our information, but I think that we can show that they do have -- there is an environmental plus with fuel cells.

COMMISSIONER SHARPLESS: Does that depend on the fuel source that is used in the fuel cell? I understand that microgen can be fairly low emitting?

MR. MILLER: Well, I'm sure they can meet very low emission requirements, too. But depending on the fuel cell -- well, I mean certainly if you're talking about photovoltaics producing hydrogen, you're talking about virtually no pollution.

When you start getting into natural gas or methanol or even ethanol and reforming those, you're probably talking about an increase in emissions --

COMMISSIONER SHARPLESS: Increased emissions over what?

MR. MILLER: Compared to hydrogen.

But I think that --

COMMISSIONER SHARPLESS: So they'll compare to microgen?

MR. MILLER: I've seen information that Ballard Power Systems, for example, has put out comparing their buses with other forms -- and this is going into transportation technology, but I think it's applicable to stationary uses, too -- which shows that the emissions potentially could be lower with the fuel cell.

COMMISSIONER SHARPLESS: Lower than?

MR. MILLER: Compared to -- well, in that particular case they were comparing it to internal combustion engines there.

But I mean that would be just one reference, one area where the fuel cells are compared to reciprocating engines, for example, as far as emissions. And I think that the fuel cells were improved.

COMMISSIONER SHARPLESS: So the Staff would be putting that type of analysis together if the Committee were to ask for it?

MR. MILLER: We could attempt to, yeah.

COMMISSIONER SHARPLESS: Okay. I would invite anybody in the audience who would have information along those lines to provide it to the Staff to help in that analysis.

Mr. Beebe, you had a comment?

MR. BEEBE: Yeah, this may help.

We have data -- we have information from the ONSI Corporation for the PC 25 that shows it to be -- shows all pollutions to be more than a magnitude less than even our cleanest, cleanest natural gas fired cogens with SCR. So that's information from ONSI.

There's corroborative information from the South Coast AQMD when they went out and they actually checked the exhaust on these things that show it's even lower than that.

So I think --

COMMISSIONER SHARPLESS: And the fuel source was what, natural gas?

MR. BEEBE: Natural gas.

I think, though, that it's interesting to note that because of the nature of a fuel cell, you really have to clean up your reactant gases prior to going into the fuel cell that will always force the technology to be cleaner in emissions than virtually anything else that you're going to have out there, that's going out have an oxidation reduction reaction associated with it.

COMMISSIONER SHARPLESS: Okay.

MR. BEEBE: And we can supply some of that information to the Staff --

COMMISSIONER SHARPLESS: Thank you.

MR. BEEBE: -- if they need it, if they don't already have it.

COMMISSIONER SHARPLESS: Thank you.

Are there other questions? Any questions by Staff? No.

We have two individuals in the audience. You have not made out a blue card. This relates to the fuel cells?

Would you like to come forward and introduce yourself? And perhaps you can leave a card with the court reporter if you have one, or fill out a blue card, or the sign-up sheets.

MR. MOE: My name's Orville Moe, with Energy 2000 in Thousand Oaks.

COMMISSIONER SHARPLESS: I'm sorry. I didn't get your name.

MR. MOE: Orville Moe, M-o-e.

COMMISSIONER SHARPLESS: Oh, okay.

MR. MOE: And we work with ONSI fuel cells. And we were not planning on commenting at this particular time.

But just on the issue of alternate fuels, I have an article here from a recent ONSI publication which indicates that they're now operating successfully off of landfill gas. And therefore it is a matter of being able to switch.

And we have several clients that are considering the ONSI as being operated from gas digesters in the sewer plant area.

COMMISSIONER SHARPLESS: What is the size of the facility that the fuel cells are --

MR. MOE: In this article there's one PC 25 that was installed at the Groton -- U.S. Environmental Protection Agency, Groton, Connecticut. And it's a 200-kilowatt unit. I understand there are a couple of other ones on the East Coast.

And we hope to be the first to have a similar unit here on the West Coast.

COMMISSIONER SHARPLESS: Thank you. Perhaps you can leave that with Staff?

MR. MOE: I'll leave a copy, yes.

COMMISSIONER SHARPLESS: Thank you.

And, Mr. Hopper.

MR. HOPPER: Yeah. I keep coming up here even though I had no intention of speaking. But questions keep arriving.

Fuel switching, maybe I need a little clarification. Fuel cells, much like cogens, are only installed in applications where you're replacing the therms or the heat of an existing boiler.

I don't understand how you could be fuel switching when, in fact, either one of these items you're installing just happens to produce electricity. If it turns out they're more efficient as a boiler, so you're replacing input or therms in, and you just happen to have a by-product of electricity.

So fuel switching also really alarms me when I'm driving around the road and I keep hearing advertisements on the radio, "Come into PG&E and we'll give you a rebate. Turn in your old electric dryer and buy a gas dryer." This is right on radio. And yet for the last 15 years, I've been beat over the head with the fuel switching, and there's no reason for it.

COMMISSIONER SHARPLESS: Well, let me read you the law. And I'm not --

MR. HOPPER: Yeah.

COMMISSIONER SHARPLESS: -- going to try to clarify it beyond what I read you.

The Energy Commission is directed to also describe in its report or to consider in its report whether fuel cells should be treated as fuel switching for purposes of application of the competition transition charge -- that's what we've been calling the CTC --

MR. HOPPER: Yes.

COMMISSIONER SHARPLESS: -- in Section 371, which is the section that deals with -- some people call it exemptions. Other people call it -- whatever the other word is, that that would not be covered by CTCs.

So that's the context in which we're discussing fuel cells. The Legislature has directed us to review this and to make a consideration whether to accept this or reject it as being exempt from the CTC.

MR. HOPPER: I understand. And that was my input, is that instead of thinking you're putting in a generation device being a fuel cell you're actually replacing a boiler or offsetting a boiler, so you're not -- there is no fuel switching taking place. It's a matter of the interpretation.

You could say from the other side that you're putting in a generation device that happens to be a very efficient boiler.

Do you see what I'm --

COMMISSIONER SHARPLESS: Well, if you're looking at fuel cells as a demand side; is that what you're talking about?

MR. HOPPER: Yes. Well, yes. Either way. But it has nothing to do with fuel switching since you're offsetting the therms used in a boiler. The point being --

COMMISSIONER SHARPLESS: Well, in this case I think they're looking at the source --

MR. HOPPER: I understand.

COMMISSIONER SHARPLESS: -- which is used in a fuel cell to generate the electricity.

And I think you're asking a different type of question.

MR. HOPPER: No, actually I'm stating a fact, that the fuel cell will produce electricity.

COMMISSIONER SHARPLESS: Right.

MR. HOPPER: But it will offset the usage of the boiler that's in that particular complex.

COMMISSIONER SHARPLESS: Right.

MR. HOPPER: See? So it's a dual fuel -- or back to the definition of cogeneration.

COMMISSIONER SHARPLESS: You're just taking it one step further?

MR. HOPPER: Yes.

COMMISSIONER SHARPLESS: Right.

MR. HOPPER: Okay.

COMMISSIONER SHARPLESS: I appreciate that point.

MR. HOPPER: And in our opinion, which means a little, but we see that fuel cells, 2020, that we will be replacing our existing cogen sets possibly in a lot of the applications with fuel cells.

So we're advocating fuel cells also --

COMMISSIONER SHARPLESS: Okay.

MR. HOPPER: -- as a long-range situation.

COMMISSIONER SHARPLESS: Thank you for your input.

MR. HOPPER: Thank you.

COMMISSIONER SHARPLESS: Okay. Anybody else would like to speak on fuel cells before we move on?

No. Okay.

Then we'll move along on the agenda there.

Item 4 was placed on the agenda to allow individuals who had some issues that they did not bring up on November 4th and 5th that dealt with Issues 1 through 7, to give them an opportunity to speak to the Committee. And I think I have a couple of cards that relate to that.

Is it Bob Mucica? Did I get that even close? Rockwell International.

MR. MUCICA: Pretty close. It's Bob Mucica.

COMMISSIONER SHARPLESS: Okay.

MR. MUCICA: And I am from Rockwell International, located down here in Canoga Park, California. It's afternoon, but let me extend my welcome to you to Southern California.

I'm sure the traffic wasn't very pleasant for you this morning, but it probably was better than most mornings though. We kind of zipped right on out here today.

First of all, I am with Rockwell International, but we are teamed with Bechtel Corporation in San Francisco for the production of solar power towers. And I wanted to make my comment today on solar power towers being an emerging technology.

Currently we have a demonstration plant located about one and a half hours from here, in Daggett, California. It's a 10-megawatt electrical power plant. And we're in the demo phase and producing electrical power.

Our next logical step is commercialization of this technology. And to that extent we have engaged with several foreign countries already, specifically India, Egypt, South Africa, Jordan and so forth.

And they all have definite interest and need for this particular type of technology.

We also are -- have already submitted a preliminary proposal and will be firming a proposal to the CSTRR, which you heard about previously, over in southern Nevada. And our anticipation is to be doing that this coming year, 1997.

So we consider ourself very fortunate to have an extensive commitment and support throughout California for this particular technology, specifically Southern Cal Edison, SMUD, LADWP, your own California Energy Commission have all sponsored and are committed to this technology through their contributions to the current demo plant, which was cost-shared with the Department of Energy.

Our petition is to participate in the new emerging funds to be set aside in AB 1890. And we wanted to go on record as doing that. We will be a part of a proposal that will be submitted to the Commission within the next week.

Thank you.

COMMISSIONER SHARPLESS: Thank you. I look forward to that.

Any other questions by Staff?

Yes, Mr. Schwent.

MR. SCHWENT: Mr. Mucica, you mentioned you felt that power tower is an emerging technology. We're trying to collect definitions of what different people think might be emerging technologies.

Perhaps I would ask you for your definition of an emerging technology then?

MR. MUCICA: Well, number one, we do think we're probably one of the prime examples. We have a demonstration facility. The R&D has been essentially completed.

We continue to invest in technology, not only through organizations like SANDIA National Labs but within our own R&D budgets internal to our own corporation.

So we are through the basic phases of R&D. We're ready to go commercial. We've established contact with potential procurers of this technology. Have received extremely favorable response.

We just need a little help to get over the hub, if you would, to launch into a significant commercial activity.

MR. SCHWENT: What specifically is the help that you would be looking to the renewables money for?

MR. MUCICA: Well, specifically we can use that for plant design. We can use that for financing.

Most of the industries independent of where a facility would be built are located throughout California.

I mention some of the supporting organizations already. What I haven't mentioned are they're basically hundreds of small businesses and trades that actually helped us in the fabrication and the construction out at Solar II.

So those are the types of industries that are a part of our team, if you would, and the type of help that we need really to help us over the hump.

COMMISSIONER SHARPLESS: If I might, back to another issue, and that is one I think that's implied in what you're saying.

It appears as though that you're leveraging different types of programs, governmental programs as well.

MR. MUCICA: Correct.

COMMISSIONER SHARPLESS: Can you give us a sense as to what other sources of funding might be available to you?

MR. MUCICA: I do believe that the California Energy Commission previously has had opportunities to request support. We almost had one this year. Some other parties didn't come through and we weren't able to execute that. That's one.

Quite candidly one of our largest areas of financial help is our own R&D budgets within our own corporations. We invest heavily in ourself towards commercialization.

A lot of the R&D conducted on Solar II was conducted with Rockwell money.

COMMISSIONER SHARPLESS: One of the things that individuals brought up in some of our earlier Workshops and meetings were to attempt to leverage these funds with other governmental funds and other governmental programs that could include funding from the Department of Energy or other federal, local, state programs that could also be looking at other types of funding mechanisms such as -- which may be available to you now, which could be tax incentives or some other type of tax credit mechanisms.

Are those available to you now?

MR. MUCICA: We have not participated in any tax-relief types of assistance.

COMMISSIONER SHARPLESS: Are they available to you?

MR. MUCICA: To the best of my knowledge, no. But that doesn't mean that I understand every type that's available to us.

To date most of our activities has either been internal or cost-shared with the Department of Energy through one of their national labs.

That's been the primary source of assistance that we've had. And we're ready to move beyond that point, fortunately.

COMMISSIONER SHARPLESS: Most of those funds are directed at the RD&D aspects?

MR. MUCICA: Yes.

COMMISSIONER SHARPLESS: And not beyond?

MR. MUCICA: Right.

COMMISSIONER SHARPLESS: Okay. Any other questions?

Thank you very much.

MR. MUCICA: You're welcome.

COMMISSIONER SHARPLESS: We have Ranji George who wished to --

MR. GEORGE: Ranji George, SCAQMD.

I'd like to make a brief comment on the certification.

When does -- on the November 4th and November 5th meeting ask for literally almost minimum requirements, just if they are QF certified, they should be automatically certified for this process.

As third-party people who are not exactly vendors, we are interested in seeing the long-term viability of renewables. I think some kind of extra requirement should be put in there so that people don't see this as -- outside the renewable sector -- should not see this as a handout, as a -- just giving away without asking anything in return.

May I propose from perhaps looking at forming a certification institute. For example, in Denmark they have an institute called RISO Institute, R-I-S-O. And over time they have been certifying, let's say, wind machines. And as a result they have wind machines, Danish wind machines have become very competitive internationally. I'm talking especially of Vestas machine and Bonus machine [phonetic].

They make sure that the quality -- they made sort of a minimum quality, and they are monitored and they are enforced totally. And as a result, as I mentioned, they have been doing very well.

I think we should require that of the California vendors or vendors who are producing renewable power for the California market, because I think many vendors will acknowledge that this actually might help them in the long run.

Just like, let's say today we have UL certification for safety. Many vendors voluntarily go for UL certification because that's a real marketing edge for them.

But UL only certifies for safety. So I would encourage looking in that option, of putting certain amount to do that.

And, secondly, if I could switch gears a little bit, I'm going to -- I stand corrected on some of my previous remarks on air pollution credits.

The VOC credits which we talked about, I mean you cannot trade it in the market as a reclaimed credit, but there are some limited provisions.

If the VOC emissions are controlled beyond what they call BACT, there is some limited provision for trading. And there are -- and if anybody's interested in pursuing that, please feel free to call me because -- exist, yes, they exist to a certain extent.

So let's go back to the certification institute, going back. I think we should look at that.

COMMISSIONER SHARPLESS: If I could ask you then, Mr. George, about the certification proposal that you're talking about.

Is there something currently being done at the South Coast that looks at certain types of technology -- let's say they be renewable -- that certifies a certain type of technology within that renewable industry as meeting certain minimum requirements that help them get through the permitting process?

MR. GEORGE: I can say about --

COMMISSIONER SHARPLESS: Is there something already in place here at the South Coast?

MR. GEORGE: Okay. A couple of points on that. As far as renewable energy is concerned, since it's zero polluting as far from air is concerned, they are exempt from air quality permitting.

So we don't require any more -- we don't have any more conditions besides the fact that they are zero polluting.

But then let's go to fuel cells. That's maybe a more appropriate example.

Fuel cells based on natural gas, and because it's a chemical process, there is some emissions involved, but it's far lower than our BACT. And we require one-time testing to certify that the emissions are low as the vendors warrant it. I mean we have to ask them to certify it to that. And once they show us once, we exempt them for any further installations.

So, yes, there is some process we impose on, some condition -- there's -- you know, So.

And the way they do it -- and the way we do it, rather, is we ask them to contact certain labs which are approved by us and the laboratory -- a private laboratory -- and they can come and test the emissions from, let's say, a fuel cell installation. Only one-time testing. And they say, okay, this is 1 PPM or 2 PPM, whatever that -- and then we exempt them for --

COMMISSIONER SHARPLESS: Is the threshold zero, though?

MR. GEORGE: Threshold zero --

COMMISSIONER SHARPLESS: Is the threshold for emissions zero? Zero emissions?

MR. GEORGE: Not really. Now we're getting a little complicated here.

But for a new installation, let's say for boiler emissions, there is a certain threshold which is not zero. It's higher than zero.

But what happens is they have to offset those emissions from other sources.

COMMISSIONER SHARPLESS: Yeah, yeah. I --

MR. GEORGE: So the netwise it's zero, but --

COMMISSIONER SHARPLESS: Okay.

MR. GEORGE: -- per equipment, it's not.

COMMISSIONER SHARPLESS: I was wondering if they are testing to meet your requirements to get the for-life certification? If there was some level of -- if there was some emission level that they were testing, too. Whether it was zero or point something another. If the South Coast Air District had set a level for fuel cells.

MR. GEORGE: Well, like any other equipment, they have to certify it meets our BACT. I mean that's required.

COMMISSIONER SHARPLESS: But they're all lower than BACT.

MR. GEORGE: If it's lower, then it goes by a equipment -- by equipment that -- fuel cells, in particular, has been exempted from air quality issues. I don't know whether that's --

COMMISSIONER SHARPLESS: Well, if you're trading, I meant you have to determine how much lower you are than best available control technology, right?

MR. GEORGE: Yeah, at least.

COMMISSIONER SHARPLESS: If you're using them as trading emissions?

MR. GEORGE: Yeah. Yeah, that's true.

COMMISSIONER SHARPLESS: Okay. I kind of get the general idea.

Thank you very much.

MR. GEORGE: Okay. Thank you.

COMMISSIONER SHARPLESS: Last card, for those of you who still have something to say to the Committee. The last card will be Dr. Aitken. Aitken?

MR. BEEBE: I'm in there again, actually.

COMMISSIONER SHARPLESS: Oh, are you? I'm sorry.

I guess I just didn't -- you had a list, and I thought I covered them. Well, why don't you come back up, Mr. Beebe?

MR. BEEBE: I think that's appropriate. Is it?

COMMISSIONER SHARPLESS: Yeah.

MR. BEEBE: SMUD has a plan --

COMMISSIONER SHARPLESS: You've got to speak into the microphone for the recorder.

MR. BEEBE: Hi. I'm Bud from SMUD.

And the plan that I've just passed out to you, and which we're docketing for this workshop, begins to explain and fill out a program which was outlined to you in last week's workshop. And it has to do with a plan for commercialization of photovoltaics using some of the monies from AB 1890 for renewables and using, of course, money from SMUD and money from anybody who's in the market with us.

It's projected at a $100 million allocation of the AB 1890 funds. And we believe that it has every opportunity of success.

The plan will not simply buy a renewable energy kilowatt hour, which will disappear then on January 1st, 2002. Rather it will seed a renewable energy future.

SMUD has been working with photovoltaics for, oh, 15, 16 years. And we have garnered quite a bit of experience. We've also gotten some lumps and learned a lot of things.

And the experience that we've learned along the way we've tried to roll into this plan in both a balanced way that will help all the other renewables as well as ourselves.

We're not trying to take all of the money and run. We just think that this is large enough bite to make a significant impact, a significant acceleration of the commercialization of photovoltaics in California.

And yet it will be not so much that it would over extend industry or others that would get into the market at this time.

The balance is needed to encourage elements in both the supply and the demand side of the equation. This should increase the possibility of broad consensus across the photovoltaic industry.

While we are presenting this plan -- we haven't done this in a vacuum -- those parts of the plan that we know best are mostly from us, parts that we've taken from other areas in the industry we've been out there talking.

And we intend over the next day and weeks to work with others in the photovoltaic industry to try to bring to you a consensus opinion.

And we'll not just bring this to you at the last minute. We'll be working with Staff to bring them along at the same time so that there is consensus from the photovoltaic industry all along the way.

The proposal that we have here talks about specific dollar amounts for the major categories.

We know that there's going to be a need for changing these specific amounts as we go along, as we learn more from different individuals throughout the industry. But the proximate amounts we believe are right.

We base that on the experience that we've garnered over the last decade with photovoltaics and particularly in the last three or four years when we have practiced our sustained orderly development program for photovoltaics.

The balance for this thing is aimed not only at ramping the supply and the demand segments of the market, but also at applying moderate, digestible segments to these segments.

This will allow them to accelerate the development of the technologies and the markets and the infrastructure needed to get the PV in usable quantities to the market. But it won't over extend any particular portion of the industry.

The three major portions of this $100 million program are $41 million for a photovoltaic system buy-down program, about $30 million to increase manufacturing capability in the state of California and about almost -- well, $28 million to go into a loan program to help the people who are going to buy these things, pay for them in the same way that they pay for long-term mortgage, in that category of event.

The photovoltaic buy-down system, and Ranji George was good enough to make a blow-up of this for me. Just a second.

Well, it still doesn't show up, unfortunately. Sorry about that.

What this lays out is a plan to use dollars from AB 1890 to buy down to what we believe is the market value of photovoltaics, so that although it is above market at this time, by the time we're done with the program, we should be producing a market that has photovoltaics available to people on a sustainable at-market value item.

We believe that the target market price for photovoltaics is at the $3-per-installed-watt value. At the present moment we know that --

COMMISSIONER SHARPLESS: You believe that's what?

MR. BEEBE: That's the viable market. If you can buy $3-per-installed-watt photovoltaics, we believe there is ample market to sustain these levels for installation in California --

COMMISSIONER SHARPLESS: What would be the targeted market? What sector would you be targeting?

MR. BEEBE: People who want electricity. I'm sorry, I really didn't understand.

COMMISSIONER SHARPLESS: Are you looking residential, large industrial, small commercial, what market would you be targeting?

MR. BEEBE: Yes. Anybody that'll buy it.

COMMISSIONER SHARPLESS: Yes, everybody.

MR. BEEBE: We don't care if -- yes, that's correct.

COMMISSIONER SHARPLESS: Okay.

MR. BEEBE: Yes.

COMMISSIONER SHARPLESS: And "everybody" is like when you have to get it to the $3 value to make it commercially viable?

MR. BEEBE: Some people may value this more than others. If you have a high-profile commercial establishment, a grocery store or a gas station -- a gas station -- you might want to pay a little bit more. And maybe you'd pay more if you want to be first in line for this.

COMMISSIONER SHARPLESS: But isn't it true that people's incentive to buy at different prices really has a lot to do with the economics of their situation?

I mean last week we heard a lot --

MR. BEEBE: Clearly.

COMMISSIONER SHARPLESS: -- about green pricing, where renewables would directed at residential because they feel that that's where the market would grow in the beginning, not in large and commercial.

You're saying that's not the case under your proposal. Your proposal would be to market to everybody.

MR. BEEBE: The proposal is to market to everybody.

We certainly think that the residential sector is a large segment of that population. But there's no restriction on this value to be only at residential. Residential is only a portion of it.

COMMISSIONER SHARPLESS: I guess maybe I should phrase the question another way.

Would this be economically attractive, as attractive to all sectors if the price was at this level?

MR. BEEBE: No. You can buy electrons cheaper than this.

COMMISSIONER SHARPLESS: So what would motivate somebody who could buy electrons cheaper than this to buy this at this rate?

MR. BEEBE: There are market -- there is market value, we believe, to renewable energy resources, particularly those that can bring to the consumer some tangible proof that they're helping the environment. That's the case --

COMMISSIONER SHARPLESS: All right. So there's going to be some who are going to be motivated from that direction.

MR. BEEBE: Clearly.

COMMISSIONER SHARPLESS: And your proposal would really be attractive to those people, in the beginning.

MR. BEEBE: That's correct. And others who might market against that, almost as a second market. For instance, grocery stores or shopping malls who might wish to show that they're interested in preserving the environment as well.

COMMISSIONER SHARPLESS: Um-hum.

MR. ALVAREZ: Do you differentiate between the renewable market and the PV market?

I mean are they the same to you?

MR. BEEBE: No, --

MR. ALVAREZ: Okay.

MR. BEEBE: -- they can't be. There's different portions of those things. Photovoltaics is renewable. But it has other characteristics as well.

MR. ALVAREZ: But the $3-per-watt as a viable market base that you establish -- I guess I'm curious about where that comes from and how is that created. I mean that translates to me as an installed-capacity cost.

MR. BEEBE: Ah, that's what it is.

MR. ALVAREZ: Right.

MR. BEEBE: You know, if you look at the way these things have been purchased in the past and, in fact, the way we're forced to deal with it at the present, we don't use long-term money for these things typically. You pay as you go.

So it's almost you put it in and you get free energy out of it. And I think that's one way it'll be marketed, if you can come up with the up-front cost you got it for the rest of your life.

MR. ALVAREZ: Right. If you get somebody else to pay for it, you've got it for the rest of your life.

MR. BEEBE: There you got, yeah.

MR. ALVAREZ: All right.

MR. BEEBE: That's an interesting nuance there. Yeah.

So what we've shown here is that at today's prices -- and this is based on very recent data that we have -- we feel that we can get installed photovoltaics in the quantity of, say, two megawatts for around $5.50 per installed watt.

These are slightly different than the cost per watt that the AMOCO/ENRON fellow was talking about. That was just the cost of the panels themselves. If you go to install these things, it takes usually an inverter and also the framework and installation costs.

If you could buy it at $5.50, which we think is reasonable, and you buy down $2.50 of that, you can offer it on the market for energy costs equivalent to $3 per installed watt. That program cost, the cost that we would expect to be paid back by 1890 funds, would be some $5 million in that year.

As we go along you can see that the incremental addition of photovoltaics, that is to say we'd add two megawatts in the year 2001, -- excuse me, 1998, we'd add four megawatts, for a total of six megawatts, in 1999 and so forth, this is always increasing.

At the same time the cost of the systems installed is coming down on the target. Our buy-down decreases. So that we level out at the end with a market quantity that's being sold at market cost.

The total cost of this program, we project, is around $41 million. And it's not an extremely large program. We feel that it's commensurate with the capability of providers in California.

Currently SMUD attempts to put in somewhere between 800 kilowatts and one megawatt of photovoltaics each year. And we do that with our sustained orderly development program of photovoltaics.

We represent about, oh, what is it, one 24th of the entire electrical energy market in California. So if we can do one megawatt a year, then the state of California ought reasonably to be able to do 24 megawatts or so.

We're looking at around an average of 10-megawatts-per-year capability here. So we're not really pushing the envelope.

We're not asking the state of California to do what SMUD has done in the last three or four years. But we are asking for a substantial increase.

COMMISSIONER SHARPLESS: Is the objective of the buy-down to increase demand and therefore increase supply and therefore benefit from economies of scale bringing down the price overall of the equipment?

Because that's what -- it's not really based on technological changes that might reduce the price of those technologies?

MR. BEEBE: No. You're not counting on technology change. But you are counting on the ability of local contractors and others who are in the market to find cleaner ways of putting it in. Faster, more expensive, more -- less expensive, more reliable ways of putting in this stuff.

The cost of the photovoltaics themselves is substantially less than these installed system costs.

COMMISSIONER SHARPLESS: So it's the installation cost buy-downs?

MR. BEEBE: There are installation cost buy-downs that are very important here. There are also, of course, increases in commercial quantities which make then these lower costs of the cells themselves less --

COMMISSIONER SHARPLESS: Explain to me how having a pot of money to reduce the cost of installations is going to improve installations or make them more reliable or less expensive? How would that work?

MR. BEEBE: Yeah. If today I can't afford at all to do a single system, then I can't learn how to do it inexpensively.

COMMISSIONER SHARPLESS: And when you're using the word "if I can't," you're referring to yourself as the installer in the business?

MR. BEEBE: That's correct.

COMMISSIONER SHARPLESS: And who are these people?

MR. BEEBE: They would be our competitors, for one. They would be people who would want to get into the photovoltaic sales and installation business.

We feel that there are customers out there available at this price. We feel that these are the kinds of costs that a supplier of photovoltaics, not just the manufacturer, but somebody that can bring it to the customer, if they're installing a hundred or more systems a year, they can probably get this kind of a price.

And if they get in the market and learn how to do it, then we see overall costs dropping in this fashion.

COMMISSIONER SHARPLESS: Do you see these people contracting with SMUD or utilities somehow to do this?

MR. BEEBE: We would --

COMMISSIONER SHARPLESS: What would be the mechanism to buy down the installation cost?

MR. BEEBE: I believe that it would be a per-installed-watt direct cost, right, a direct subsidy. That's the way I see it. I don't --

MR. BLEES: Take us through step by step how it would work? I mean it's January 1st, 1998. The hundred million dollars has been allocated to this PV program. What happens? Who's got the money? Who does it go to? Who does --

MR. BEEBE: The first thing that --

MR. BLEES: Who's installing the PVs on whose roofs and so on?

MR. BEEBE: The first thing that happens is you have to allow for some time for people to get moving on the whole thing. It's going to take a year or more for people to really understand how to do this.

If you look at this first year here, we've got two megawatts targeted. We do almost a megawatt ourselves now. So that's not doing much business in the first year. But it starts to go up rather dramatically after that.

That's because it's going to take time and signal from people that there really is something here. You've got to order the hardware, you've got to go out and line up your customers. You have to figure out what kinds of prices you're going to offer to the customers and that sort of thing.

So it takes a while to do that.

But if you know the money is there and you know that up to a certain quantity, it'll have this kind of buy-down, then we believe that the entrepreneurs will come out, not only SMUD but other potential providers.

MR. BLEES: My question, and I believe Commissioner Sharpless' question also is this: Again, it's January 1st, 1998, or 1999 or 2000, when everybody's really ready to go, the Energy Commission has a hundred million dollars and we're ready to write checks.

To whom do we write the checks?

When that entity or person gets the money, what does he or she or it do with it?

Who installs PVs on whose roofs? and so on?

MR. BEEBE: For this --

MR. BLEES: Walk us through --

MR. BEEBE: -- particular part of the plan, and I realize that this is one of the three major prongs of this program, for this program you would supply it to the person that ordered it from the factory, sold it to a customer somewhere and either had a subcontractor or they themselves installed it.

They put one watt on the roof and they then send a bill to whatever trust fund you have available and ask for in year one, $2.50.

If they put in two watts, they put in a bill for $5.

COMMISSIONER SHARPLESS: Could I ask a question?

Are you still working on this proposal?

MR. BEEBE: Oh, certainly. This is dynamic. And --

COMMISSIONER SHARPLESS: What more needs to be worked on in this proposal? Like the details that Mr. Blees and I are talking about? Or --

MR. BEEBE: Surely. And as I tried to mention, because of our sustained orderly development, SMUD feels more comfortable with some of these numbers than others. This particular stuff is taken right out of projections that SMUD has from our programs.

You can see from the other parts, particularly those parts aimed at increasing manufacturing capability in California, those are going to require a great deal of input from other parts of the photovoltaic industry.

We are working now and will continue to work with PV industry people to try to bring you a consensus proposal.

COMMISSIONER SHARPLESS: Okay.

MR. BEEBE: It would be helpful if you would let us know perhaps some specifics that you would want out of that.

COMMISSIONER SHARPLESS: Okay. I think they're really basic, to begin with. But would Staff like to comment?

MR. MASRI: Yes. Mr. Beebe, you talk about AB 1890 money. Now you realize that there is more than the IOU money for renewables in the 1890. Are you factoring in here any part that the munis are supposed to raise for renewables for AB 1890 or is it all non-muni money?

MR. BEEBE: This plan --

COMMISSIONER SHARPLESS: Nonrenewable you mean?

MR. MASRI: Not munis.

COMMISSIONER SHARPLESS: You mean all IOU.

MR. BEEBE: Non-muni money.

COMMISSIONER SHARPLESS: Right.

MR. BEEBE: This plan is IOU money only and is a broad plan. To the extent that SMUD will participate with their own money and supplement this, leveraging both your funds and are own remains to be seen. That's a detail that will be worked out.

In other words, I can't stand here and commit SMUD funds to this process at this time.

MR. MASRI: I just wonder, is -- this is maybe a chicken-egg question, but is the price drop that you have driven by the amount of megawatts that you buy and therefore is being manufactured, or the other way around? If you get the price that low you can then create demand equal to that first column? Which is it? What's driving what here?

MR. BEEBE: If you can sell this many megawatts in California in the year whatever it was, 2001, --

MR. MASRI: Um-hum.

MR. BEEBE: -- then we think these prices will have become achievable, okay?

You're right, it's chicken and egg. You have to run it along as you go. If you look at the prices we've paid for photovoltaic-installed systems over the last three years you can see they've done better than our best projection so far. And we see these as attainable, but whether it's because -- I don't believe that if SMUD had not gone out and done its program, that we would be looking at prices as low as they are today in Sacramento for installed megawatts. I just don't believe that. But -- it did take our program to do that.

COMMISSIONER SHARPLESS: But you haven't been offsetting the cost of installation? Or have you?

MR. BEEBE: Yeah. When we -- the way we do our program is we ask people -- I mean we ask subsuppliers to bid for an installed watt. We say, "We're looking at so many systems. What would it cost SMUD to buy this system from you to put on a roof?"

And so the cost of the installation, the cost of the arrays, the cost of the inverter, the cost of the conduit, the whole thing is bundled together.

And it's difficult for us to unbundle those in this type of a venue. Perhaps we can talk to Staff and others at the detail level to look at that.

But I think you're really trying to get at what causes these -- why would you have faith that these prices would come down in this way. And that's where I think two things need to be brought.

One is the experience that SMUD has had over the last three or four years that show that this happens.

And, secondly, to look at the world market in photovoltaics and understand that it's not California alone that's driving this. This will only Californians to accelerate it and have it earlier and better. We can be a leader rather than a follower.

Maybe jumping ahead just a second, but the second prong of the program is to put $30 million towards increasing the manufacturing costs -- or, excuse me, increasing the manufacturing capability for photovoltaics in California. And you say, well, you know, why should we do that?

And I'd say that you ought to ask the guy from AMOCO/ENRON why they put their new photovoltaics plant on the foggy banks of the Chesapeake? It's because they got incentives to do so. Why wasn't that plant in California? We've been the leader.

I think we can use this money to increase the leadership that California has had in the past and will have in the future.

I think we can use this money to bring the capability to the people here in California rather than importing it, rather than exporting our dollars out and buying stuff on the outside.

And this is a world market item. So we're going to gain in the long run if we can get some good capability in California. That's the reason item 2 is there, is to help those manufacturing people relocate back to California.

COMMISSIONER SHARPLESS: Well, I think it is important to factor in what -- you being a municipality -- what the municipalities would be sharing in the cost of this program. And we haven't talked much about that.

And I think that that's certainly something that we ought to talk about and how we integrate these programs and maximize the usefulness of the money and coordinate what it is that we're attempting to do.

With respect to the other question you ask, I don't know whether you've received it yet. I intend in closing to draw attention of those of you in the room to the set of questions that came out in the hearing notice for next week's hearing and the following hearing on allocation criterion and certification.

There's a number of questions there that we're asking of parties who are bringing forth proposals or bringing forth issues, to help put together information so that the Committee will have a basis on which to weigh and balance and make decisions. So you might want to look at that set of questions as you bring the proposal back to the Committee.

MR. MASRI: We do have copies of that notice with us here today, if somebody did not --

COMMISSIONER SHARPLESS: Do you know where they are, Marwan?

MR. MASRI: Carrie has them right here.

COMMISSIONER SHARPLESS: Oh, okay. Fine.

But I do want to thank you, Mr. Beebe, for your work in this area and for bringing this proposal forward. And we look forward to having further discussions.

I -- yes, Mr. Blees.

MR. BLEES: One last quick question.

Mr. Beebe, for a typical residential customer in Sacramento, what is the $3-a-watt-installed translate to in terms of cents-per-kilowatt hour?

MR. BEEBE: It depends on what they paid for money. Somewhere under 10 cents.

MR. BLEES: Under 10?

MR. BEEBE: Depending on what they paid for money.

COMMISSIONER SHARPLESS: Paid for what? For money?

MR. BEEBE: For money, yeah. Which gets us to the third prong. The --

COMMISSIONER SHARPLESS: Oh, I see what you're saying.

MR. BEEBE: -- low-loans program. Yeah.

MR. ALVAREZ: A couple of questions.

COMMISSIONER SHARPLESS: Yes, Mr. Alvarez.

MR. ALVAREZ: Can you provide -- just give us an indication of what it is you paid per watt on the programs, on the existing purchases SMUD made?

MR. BEEBE: Yes. That was in an attachment that we made in a filing last week, the workshop statement from November 6th. In the end there we have a paper that Don put out -- Don Osborn from our solar programs, put out.

And it shows in there what SMUD has paid for installed costs for photovoltaics.

MR. ALVAREZ: And what was that number?

MR. BEEBE: Well, Manuel, I don't have my glasses on, but I can try to do it. I'm sorry. Which number do you want?

MR. ALVAREZ: The actual --

MR. BEEBE: For which year?

MR. ALVAREZ: The actual price that SMUD paid for its installed PV cost.

MR. BEEBE: In 1995?

MR. ALVAREZ: Well, you said you've been running the program three years, so I'll take the average or you can give me all three individually. I just want to get a ballpark feel for what that cost is.

MR. BEEBE: Don is our expert, and I have to be careful on record, but the numbers I remember him saying were $6.40 in '95 and $5.30 in '96, I think.

MR. ALVAREZ: Okay. And then --

MR. BEEBE: But I really have to be careful with those numbers. I'm not the --

MR. ALVAREZ: I'll follow up on that.

MR. BEEBE: -- detail guy.

MR. ALVAREZ: The proposal for the program that you outlined here, do you consider this a program to be statewide and --

MR. BEEBE: Certainly.

MR. ALVAREZ: -- any consumer can participate, any PV vendor can participate? Or do you see it just participating within the investor-owned-utility service areas?

MR. BEEBE: I believe that if you try to constrain it only to the IOU structures, you'll get -- you'll be regulating markets again and it's going to be more difficult. I think if you just let it go, we'll be okay.

We understand that we have an obligation to work with the process and the extent to which our monies are leveraged against this and your monies are leveraged with ours is to the good. We just need to work towards that direction. Does that --

MR. ALVAREZ: Yeah. I guess it'll have to wait to see whether SMUD creates a similar type of public-goods charge for these kinds of programs or not and whether they can mesh together or not -- I guess what it raises to me is an equity question of whether the ratepayer and an investor-owned-utility service area who pays this charge can actually transfer money from that area to a municipal service area, SMUD or the irrigation district in Imperial or in L.A.

MR. BEEBE: Yeah.

MR. ALVAREZ: So it's an equity question.

MR. BEEBE: Well, as you know, we are required to have some minimum public-goods charge. And what the makeup of that public-goods charge is under public discussion at this time, so we'll just have to see what comes out.

But noting SMUD's past good work in this effort, I certainly wouldn't be surprised if we have a pretty nice program when it all comes out.

COMMISSIONER SHARPLESS: Yes, Mr. Schwent.

MR. SCHWENT: Mr. Beebe, just a point of clarification perhaps.

When the buy-down amounts that you have in your proposal there, while those amounts, as I understand your proposal, would go to the seller of the PV system, --

MR. BEEBE: The enabler somehow, yes.

MR. SCHWENT: -- the enabler somehow, is it your intent that somehow that buy-down amount, though, is also -- filters back and helps reduce the cost of the PV modules, the balance of system as well as the installation costs?

I think that's what you said more recently. But earlier when I think Commissioner Sharpless asked that question you seemed to be saying it was just the installation cost that was being bought down by these sums?

MR. BEEBE: No. It's the installed -- the whole -- how it's apportioned through the installed system will have to be -- it will be the subject of market force.

MR. SCHWENT: So it would --

MR. BEEBE: If you give the money to the person in the middle and they're buying and they're selling and so forth, if they can get more than $3 a watt from the general public, I'm sure they'll do that. If they have to --

MR. SCHWENT: So it's your intent that the buy-down helps reduce the price at all levels in the process, the price of making the cells, the price of making the balance of systems, the price of figuring out how to install these systems on people's homes or businesses. Is that --

MR. BEEBE: The buy-down will specifically help to lower the cost to the end consumer, we believe. And with the costs of manufacture being held both by the increase in sales and by the $30 million that go directly into augmenting manufacturing capability.

MR. SCHWENT: I'd just point out that earlier Commissioner Sharpless and Manuel asked about this $3 watt number. I'm not sure exactly what -- the origin here, but in general, yes, at around that $3 a watt number, with typical financing that you would have, say on your home, that's generally the number that the PV industry puts out as about the price point at which it would make sense for a net metering customer to put a PV system on their house, roll it into their mortgage or whatever and have it make a cost-effective investment for them.

And also I just point out the Commission funded a study in conjunction with SMUD where we had a contractor look at what would be the value of PVs to be purchased by SMUD in the SMUD system for grid support, TND deferral, et cetera. And when added up all the benefits to SMUD, again we got a number of about $3 a watt where it actually would be cost-effective for SMUD to buy PVs unsubsidized, put them on their system and have it be effective for them as well.

COMMISSIONER SHARPLESS: Is that a public study? A study that's been published?

MR. SCHWENT: It's in the process of getting a cover so we can make it an official Commission publication. It was completed about a month or two ago.

COMMISSIONER SHARPLESS: I think that would be something you might be interested in, Mr. Beebe.

MR. BEEBE: Certainly, yeah.

COMMISSIONER SHARPLESS: Okay. Thank you.

Other questions?

Mr. Beebe, I know that was an introduction, --

MR. BEEBE: Correct.

COMMISSIONER SHARPLESS: -- but you've whetted our interest. And we're looking forward to seeing more details on your proposal.

MR. BEEBE: Thank you very much.

COMMISSIONER SHARPLESS: Thank you.

Okay. Well, that certainly generated one more speaker to come forward on this issue. Mr. Nelson, Cal Solar Energy Industries Association.

MR. NELSON: Good afternoon, Commissioner, members.

After hearing some of Mr. Beebe's comments I thought it would be appropriate to describe to you a little bit more in depth what's taking place as a result of our need to come to an industry consensus about how to utilize monies from AB

1890.

And in regards to the photovoltaic industry, the California Solar Energy Industries Association as well as the Solar Energies Association in Washington represents about 500 companies across the country, including most of the major manufacturers, actually I believe all of the major manufacturers, many contractors, suppliers, et cetera.

The ways to use this money are probably going to be applicable everywhere in the country for any situation that were to arise where a similar amount of funds became available to assist the commercialization of the technology.

And as such, we're kind of struggling as an industry, as you can tell, in crafting appropriate methods of program design including who the correct recipients of these funds are, et cetera.

The proposal that Mr. Beebe introduced you to today has, in fact, been worked on not just within SMUD but in other parts of the industry over the last couple days and it may very well turn out that it comes out as a -- almost a master document under the auspices of the entire industry.

I can't say that for certain. But I do know that our conversations have extended to Mr. Osborn and others in the recent days.

Because, really what makes sense for SMUD makes sense for all of the locations here in California. And SMUD is not the only utility here in California that's interested in photovoltaics. Southern California Edison has a very active program that's been ongoing for the last couple of years in that regard.

But we haven't been faced in years past with a situation where we've had these kind of funds available to be used for purposes which can accelerate the commercialization of the technology. So we've been wanting to be very careful in coming up with the methods that we believe would be most useful and most effective in employing the monies.

And for that reason you don't have a final document, but I believe that I'm safe that saying within the confines of the timeframe outlined by these Committee proceedings, that we'll have one in front of you. Hopefully that's next week. But there's a lot of work to be done on the details.

I also wanted to point out that in your conversation with Mr. Beebe, the topic came up about who would put the equipment in. And just to let you know that there's a very healthy infrastructure around California in the photovoltaics industry.

In fact, we are viewed as the world leader in this technology both from a manufacturing and from a contracting and supply perspective.

The net metering legislation that's often referred to in these conversations was just passed last year. And it was through a ground-level support effort that really pushed that legislation to the forefront, and got it passed in record time.

It's one more item that adds a slight additional economic improvement to the economics of owning a photovoltaic system.

However, today's prices are above market and we do need to find these mechanisms to bring the price down to market such that the volume can be brought up. Because as your series of questions ascertained, in fact, volume is the only key to getting price down here. There's not necessarily technical advancements needed. Although, they'll, no doubt, happen here in the next few years.

The primary driver of pricing for photovoltaics is volume. And the efficiency improvements in manufacturing, et cetera, come as a result of that.

While I'm standing here I may as well also indicate that CALSEIA and SEIA also represent numerous other technologies including the trough technologies that are used at the SEGS plants and in the deserts; the power towers that Mr. Mucica mentioned; Dish Stirling.

And each of these technologies has a different set of requirements which may very well yield totally different recommendations in regards to how the technologies are moved forward within the emerging technology component of the program.

I still haven't figured out if I'm going to be able to shoe-horn these all into one big proposal or if each of these technologies may need to have their own proposal within or under the roof of the emerging technologies.

Technically they're all solar, and many people would consider them to be the same. But really they're a lot of differences in both price points where they are in the commercialization level.

Also their intended markets are different. PV, for instance, its strength is in the distributed market, which would lend itself to residential applications and small commercial, et cetera, where some of the other technologies are large scale and would be applicable to more central generation applications.

So we're working some of these details out and I am appreciative of your desire for some of the details. And as soon as we can make them available as an industry, we'll plan on doing so for you.

COMMISSIONER SHARPLESS: Thank you, Mr. Nelson.

I have one question. And that's back to something you said sort of early on in your comments that talked about looking at this from a national perspective, that while this is going on in California, it's really -- many states are struggling and working toward this same effort.

Along those lines, is there synergy that we can tap from other state programs that are offering funding, other federal programs that might be offering funding that we look at as we design some program in the state of California, if that turns out to be what we do?

MR. NELSON: Well, I will say that the other states are very interested in restructuring, as, no doubt, you're aware, from --

COMMISSIONER SHARPLESS: But they haven't set aside any monies to do renewables or solar?

MR. NELSON: I get calls daily to go and talk to them about how they ought to set up their renewables programs in their states.

And the fact of the matter is we haven't quite figured out here today yet what the best way to do it is. I will say that a number of the states are leaning more towards a portfolio standard approach, which is just a flat percentage by requirement, which has its own set of problems that we dealt with in a working group this summer in accommodating various price levels of technologies.

But the bottom line answer to your question is I think many of the other states are more looking to learn from us than we will, at least in the near term, have the ability to gain from their experiences.

I will say, though, that your comments did resonate with me in regards to the ability of some of these technologies and activities to attract notice from, in particular, DOE and the national labs.

I think there are many opportunities particularly in the emerging technologies to be able to leverage those funds to help us in our efforts here in California.

You know, when you're at DOE and you talk about solar, people think about California. We are the state that's synonymous with this resource.

And for that reason the -- DOE R&D activities, in one way or another, are directed towards California activities in one direction or another.

And DOE has its hand in a number of different technologies, but without being specific about exactly where they came or would come from, I can say that the DOE is very interested in these proceedings. And I personally give a briefing to a DOE individual on a weekly basis on developments.

COMMISSIONER SHARPLESS: Any other questions?

Thank you. We look forward to seeing you in the future.

MR. NELSON: Thank you.

COMMISSIONER SHARPLESS: Okay. Now I do believe we're down to the last card. So I'd like to call back my friend, Don.

DR. AITKEN: Thank you. At the end of a long day for all of us.

COMMISSIONER SHARPLESS: Yes.

DR. AITKEN: May I just take a minute to address just a couple of the points on the discussion we've just had, also --

COMMISSIONER SHARPLESS: Sure.

DR. AITKEN: -- the same interest as Vince and Les in trying to clarify a little bit of some of the points.

Just in the way of looking at renewables in terms of cost-per-watt rather than cost-per-kilowatt hour, that's the problem with having something where you buy it up front.

And then as Bud said, that it's basically free energy from there on, well, of course it isn't if you spread the costs out over the years.

It's important to note that a coal-fired power plant, for example, three-quarters of the cost is coal. So when you see a company saying we can build a modern coal-fired power plant for a dollar a watt or a thousand dollars a kilowatt. And you guys are saying you're going to be economic at $3 a watt. But we can do it for a dollar a watt.

What they're not telling you, there's another $3 a watt over the next 20 years down stream that you're going to pay anyway.

So if you insisted that you wrote a 20-year contract with a coal-producing company for electricity production from coal, and said, "Okay. This is going to be a one-shot payment. We're going to give you all the money upfront."

Then all of a sudden they'd say, "Oops. Well, it really is $4 a watt, folks." And $3 a watt for PV does look a whole lot better.

It turns out not to be quite the case because, of course, you're discounting. You've got the benefits of discounting the future cost of coal because it's worth less in today's dollars since you can buy it over the years. Which is one of the reasons why PV people and renewable people also would like to have multi-year contracts where you can bill different amounts of the product in further and further years, where you actually can get more megawatts for the same amount of today's expenditures.

On the other hand, even though, for example, a five-percent discount rate would make $4 a watt for coal appear to be two and a half dollars a watt over 20 years, but that doesn't take into account inflation.

Now the moment you say, well, there may be five-percent inflation, whoops, we're up to $4 a watt again. So you've got all that stuff going on.

And when you're talking about the renewables, you don't have any of that stuff. You have none of those uncertainties: Inflation, discount, whatever. You've got cost of money which is critically important. We heard that from Bud and others.

And any incentives you can do to help buy down to make it attractive through cost of money, financial means and so on, are incredibly important. And I really encourage -- the CEC Staff is working hard on those financial-benefit approaches.

Secondly, on the origin of the $3 a watt. It actually surfaced in a 1994 analysis and then publication by the Utility Photovoltaic Group. It had become kind of an industrywide standard, but it surfaced in that analysis, which was done by a consultant for them.

And they came out with a market projection across all these different sectors that you were asking about. And the projection was huge. I think it was like 8- or 9,000 megawatts, something like that -- I'm looking to Vince, who's remembering some of these numbers -- of the potential market for photovoltaics, if you can get down to $3 a watt.

And that's domestic market. And it might be useful to remember that the world production of photovoltaics last year was of the order of 80 megawatts. It might have made a hundred. I'm missing numbers now, but very small.

The largest segment -- well, the answers that were given, that Vince gave you, for example, is that at $3 a watt, if you put in on a 30-year mortgage, you're going to come out ahead of your monthly electricity costs.

And it also turns out when you look at the benefits of transmission distribution, upgrading and deferral and so on, $3 a watt, several different analyses for several different market sectors happen to come out, just happen coincidentally to come out around $3 a watt. That's a very real number.

So that's become a target number for the industry, the photovoltaic industry to try to reach.

The third comment is on sustained orderly development, for which I take some pride in authorship. I wrote papers in '91 and '92 where I developed the concept of sustained orderly development that was adopted by SMUD and others.

And you just heard what it is. It essentially is volume. It's a modern version of what we call vintage levelizing of costs. If you look at the Model T and the Model A, how many -- how the costs went with production. It had nothing to do with time. It was just volume. The more Model As and Model Ts you made, the lower cost.

The same thing is now happened with computers. The more computers you made, the lower the cost.

And we are able to show by following what's happened in the wind industry already and on solar thermal electric what was happening, that they were following the same curves that these other industries had followed. These are straight well known commercialization-versus-volume things.

And so to have a program where you are promoting the sustained orderly development means doing whatever you can to get volume purchases out there. And you can have the confidence on the basis of other industries that it works. But thanks to SMUD -- and SMUD is an extraordinary national example.

SMUD is the only organization in the United States that's been able to show from experience that sustained orderly development works even on relatively small purchases, of the order of a megawatt or so a year. Because you're doing it reliably year after year.

It is the sustained acquisitions. It is the orderly year-after-year acquisitions that do it. And that's what they're trying to generate with these funds.

And my final comment just on this is on the 540 million. We have to be careful with that number. I'm pleased that just now the question raised the issue, as you did, how many other states can we lean on now for experience?

The answer is Massachusetts is the only one you can lean on right now, that has adopted a kilowatt-hour incentive to promote renewables, with that incentive gradually increasing over the next few years.

And it is true that several other states, Vermont and Arizona, for example, are going the route that California had gone through December 20 of last year. That was the minimal renewables purchase requirement, or what some of us called the renewable portfolio standard that made it the price of doing business in the state. But that's gone. We don't have that.

It's not gone nationally. And in the Shaefer Bill, you are aware, I'm sure, that the portfolio standard is alive and well, and we're just talking about numbers.

So where did the 540 million come from? It had nothing to do with any thoughtful appraisal of what it takes to commercialization renewables. And that's the Catch-22 that we are all dealing with now.

It was the decision that there will be an extra three months of the CTC that will assure the payment -- you know all of this. That three months from March -- I mean from January to March of '02. And the estimate was that it would be 540 million.

Now I've seen estimates that say that could be as high as 890 million. No one really knows. I talked to Robin Walther at lunch, and just the utilities don't -- and no one knows what it's going to be.

And so it was number that was somebody's best guess of how much money can we get in.

And then they turned to the renewables people, and said, "Okay. Guys take that and commercialize yourselves and make it work." And that is a terrifically difficult assignment.

And the only way that assignment is going to work is with a multitude of mechanisms being placed before you. Some of the mechanisms providing incentives to customers to go out and buy this. Some of the mechanisms promoting green acquisitions so they'll pay more. Some of the mechanisms for financial instruments to make it more attractive for you. Some of the mechanisms to bring industry into the state so that we can get lower costs and so on.

It really is going to take a carefully thought out package of all of that to make maximum -- to get the maximum benefit of what we're trying to do.

And so your questions are all right on the mark: What are you going to do January 1, '98. Well, I don't know what I'm going to do. You know, these are our best ideas and this is what we're proposing. So we have to be very careful on how handle these numbers. The 540 million is not a magic number that says we shall be commercialized.

In fact, I don't think we're going to be. I think we've got longer-term programs. I think we're going to be well on the way.

Having said all that, may I turn to the reason you had me up here?

COMMISSIONER SHARPLESS: Please.

DR. AITKEN: Unless you had any questions on this brief monologue?

COMMISSIONER SHARPLESS: No. No.

DR. AITKEN: Okay. The reason I was up here, to try to clarify an assignment that I seem to have given myself at the last hearing. And that was to try to pull together a coalition, sort of agreement, on at least some simple basic factors so that you can know that people agree on some basic things and you can deal with details.

So I went over my notes quite carefully, especially after I received a phone call saying, "Do you realize what people say you have agreed to do?"

And I said, "Oh, whoa."

We had the discussion last week, and only a brief recap, I won't redo it. But you were seeking for simple definitions of things. And "simple" means as simple as we can to try to have criteria to certify and so on.

And the main targets of certification right now are to be eligible for the 50-percent direct access incentive certification and / or to be eligible for access to this 540 million. So that's the focus of the certification right now we're talking about.

And the argument I presented last week is, all right. But just don't constrain that certification then with arbitrary rules including rules of if a project comes in, how much must be renewable versus how much is allowed to be non-renewable. Let the market work that out. Let the investors work that out.

And that was the basis of the discussion I was having leading to this coalition thing. I propose that we de-couple these kinds of rules and say, let's just really focus on renewables.

And no opposition has surfaced from that. Everybody seems to be in agreement with that. The gas industry has said there's certainly an agreement. The solar thermal people are certainly in agreement. Other people, even wind -- other people in agreement to have that flexibility.

So I felt here was a kind of consensus thing. At least there is agreement on some basic rules that we can go along with.

And so from my notes of what I think I agreed to do was how to describe in simple terms a renewable technology that would be eligible for certification first.

That's just a technology description. It won't be zero emission, as you well know because of geothermal and biomass. But a basic technology description that would make that technology eligible for further discussion or for certification.

And then secondly I was proposing -- and this is what I'm going to inquire with -- a round robin of faxes and Emails -- I was proposing that we automatically certify all the existing QFs even though they may have 25-percent nonrenewable, but that as we go to the future that we open up and that we focus just on the renewables.

And one of the reasons for that was to give you an opportunity to respond to the requirement in the bill, that you give special consideration of solar thermal because of its peaking power benefits and biomass because of its environmental benefits, which means there are going to be different financial ways of looking at these things when they come in.

And basically when you look at biomass and solar thermal, you're dealing with QFs and you're dealing with existing as it is. So it becomes rather simple to split these between existing and new, and to simply open up the arguments for new.

And so as I had on my notes I would just seek a consensus position, where is everything on that? Are they okay with having the different rules between existing and new? Are they okay with not having prescribed ratios of renewable versus nonrenewable?

Now in the phone calls that have come in, there are three more elements that I'd be willing to try to add to that, and may be part of the understanding that you went away with.

One was to agree on mechanisms to assure contractual performance by renewables. Is there a simple set of mechanisms by which we can say, yes, by golly, you're a renewable and you created so many kilowatt hours, and we know you did, and you met your contract?

Secondly, to see if there's a kind of basic agreement on mechanisms to assure that the contracted portion is credited to the customer.

COMMISSIONER SHARPLESS: Okay. So this gets to the provider definition?

DR. AITKEN: Yeah. This is all provider stuff at the moment.

COMMISSIONER SHARPLESS: Right. Um-hum.

DR. AITKEN: Yeah. And this is just -- it's a question whether I should go on a little bit and see whether there is sort of basic agreement on just some of these structural bases.

COMMISSIONER SHARPLESS: I think clearly that was part of the discussion, this idea of agreement as to what you pursue. I think that was more or less left open as to -- I don't know if other parties are going to be bringing forth, from their own perspective, in other words, Don, certification proposals.

I think it's valuable that the perspectives be discussed among the various parties so we can see where they match and where they don't match.

I think the Committee's going to have to sort through what the policy issues are within that broad context of certification.

I think one of the -- you've laid out a whole series of things. One of them --

DR. AITKEN: A couple bases --

COMMISSIONER SHARPLESS: -- one of them that I think I should go back and maybe clarify from last week is that the issue that you brought up -- and I think you were the principal that brought it up -- was the issue of the 25-percent fossil fuel.

There is a debate as to whether or not the law requires that. And there are people on both sides of that debate.

I have some concerns, as I've already expressed, as to not just from the legal standpoint, but also from good-public policy standpoint what we ought to be doing in that arena. But I have left it open to say: Bring your case. The burden of proof is on you. Bring your case and present it to the Committee.

DR. AITKEN: I was simply going to send out -- and this is really quite naive, but in representing a public interest group I get to be naive -- was going to send some faxes out to people.

In fact, to those of you who have not given me your cards and would like to receive the fax, it amounts almost to an Email chat to just see where we are on this, and just come into you with -- next week saying, look, this seems to be a majority sort of opinion or view on two or three of these things that I've mentioned.

And I still offer to do that. And for those of you who are here who have not given me your card and would like to be part of it, I'd like to ask them to do that.

I'd like -- just be careful on the 19th now, as I know you're aware of the CPUC thing.

COMMISSIONER SHARPLESS: Yes.

DR. AITKEN: I'm an invited participant on two of the four panels that meets from 2:00 to 5:00 in the afternoon.

COMMISSIONER SHARPLESS: I know. There's three hours for all public policy programs. That's --

DR. AITKEN: I know. Well, we're not allowed to say anything.

COMMISSIONER SHARPLESS: -- interesting.

DR. AITKEN: We filed -- we've already filed in writing and we're supposed to answer questions.

But I notice in your agenda for the workshop you did put emerging coalition efforts right after the opening, and that would work.

COMMISSIONER SHARPLESS: Right.

DR. AITKEN: So those of us who are going to have to split --

COMMISSIONER SHARPLESS: I think that's the reason why we did do it. And you are sort of anticipating what I was going to say --

DR. AITKEN: Okay.

COMMISSIONER SHARPLESS: -- in closing.

You're talking about a certification process. And we, in looking on how to focus our various workshops, thought that the 26th would be a good idea to bring forth any proposals that people might have on certification.

And on the 19th we would be looking at a discussion on allocation criteria.

So that was generally how the workshop notice has been laid out. I recognize that you all may not have had an opportunity to look at that notice because we sent it out a Monday -- or a Friday, and Monday being a holiday, I don't know how many of you have received it as yet.

DR. AITKEN: Well, we have it here.

COMMISSIONER SHARPLESS: Right. That's why we brought it.

DR. AITKEN: Right. Which is where I read it.

The final difficulty with all of this is, of course, the schedule is being laid on all of us by everybody with short notice.

And the week of the 26th I am Cyprus and Stockholm giving long-scheduled lectures, which are really important to me personally and professionally, and I will be gone. So I will not be participating on that.

But I think what I do next week can at least lay the foundations. And then if you do do one more hearing -- workshop, excuse me, as I heard you suggest you might do an early December, I would --

COMMISSIONER SHARPLESS: Right.

DR. AITKEN: -- be delighted to participate in it.

COMMISSIONER SHARPLESS: Well, I can tell you that the 19th and 26th will certainly not wrap up everything. They are intended to bring out proposals and further discussion and really start doing the analysis on the proposals.

So I think given your schedule, even though the 26th, I think, will be a busy calendar, we'll try to accommodate that. But there will be certainly more discussion that you'll be able to participate in.

DR. AITKEN: Finally, I never introduced myself. Do I need to do that for the record? Do you have the blue card. I'm Donald Aitken of the Union of the Concerned Scientists.

[Comments off the record.]

COMMISSIONER SHARPLESS: Okay. Thank you very much.

This comes to the end of our agenda. And no more blue cards. So it looks as though we've exhausted, if not, the audience, the agenda.

And given the fact that we all probably need to get out of here in order to miss some of the congestion, I'd like to wrap up by once again thanking you all for your participation.

It is through your participation that this Committee will be able to carry out and fulfill the requirements of the Legislature.

We need your ideas. We need the information that you have. We need to understand the implications to your industry. We need to measure that against the mandates we have to try to determine how to develop this policy in the interests of public and public interest.

So we've discussed already quite a bit. The fact that on the 19th and the 26th we have a workshop notice out that covers both of those. For those of you who haven't already picked them up, they're over there by Cynthia. And they're also probably -- Carrie, sorry -- and they're probably also in your mail box.

So we look forward to seeing you in the future here.

I would just like to underscore that if the participants, in offering proposals, could, in writing, provide those proposals to the Committee in advance? I think that would be very helpful. It's not required. But I think it would be very helpful to further our discussions.

So with that I would like to just thank you again and see you all -- or some of you at least -- on the 19th.

We stand adjourned.

[Workshop concluded at 3:35 p.m.]

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CERTIFICATE OF REPORTER

I, **CAROL A. DAVIS,** a duly commissioned Reporter of **CourtScribes**, do hereby declare and certify under penalty of perjury that I have recorded the foregoing workshop which was held and taken at the **CALIFORNIA ENERGY COMMISSION RENEWABLES PROGRAM COMMITTEE WORKSHOP on the Implementation of Restructuring Legislation (Chapter 854, Statutes of 1996 AB 1890): Renewables**, in Diamond Bar, California on the **12th day of November 1996**.

I also declare and certify under penalty of perjury that I have caused the aforementioned workshop to be transcribed, and that the foregoing pages constitute a true and accurate transcription of the aforementioned workshop.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in the outcome of said workshop.

Dated this **18th day of November 1996** at Foresthill, California.

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CAROL A. DAVIS
REPORTER